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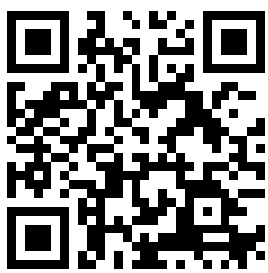

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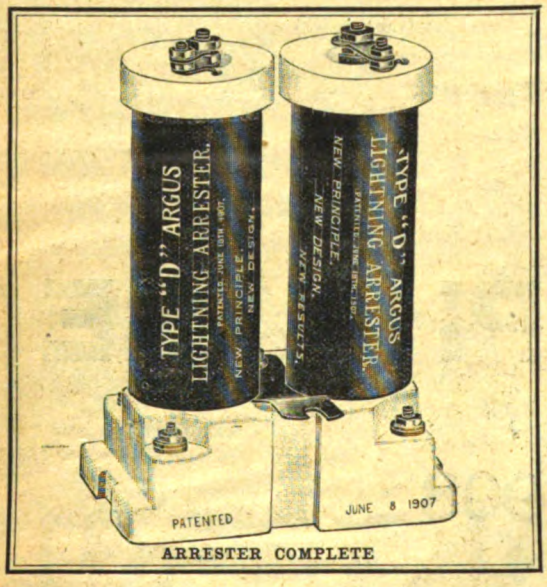

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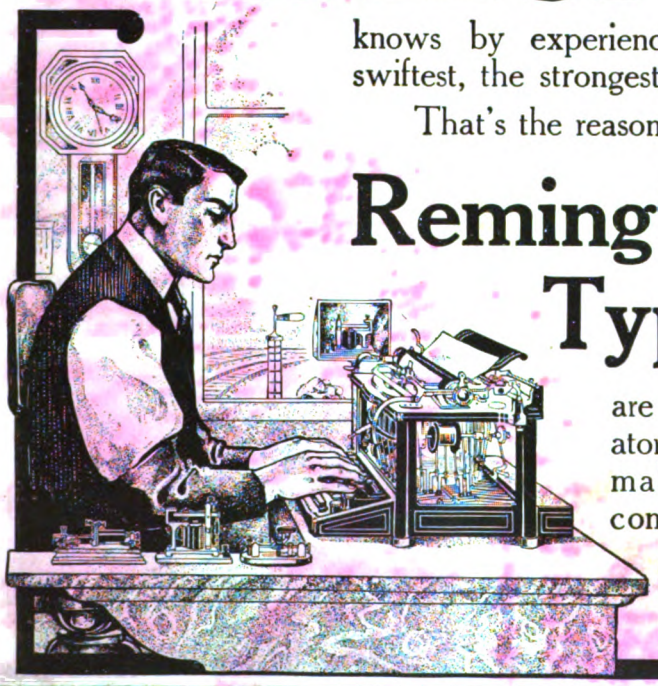

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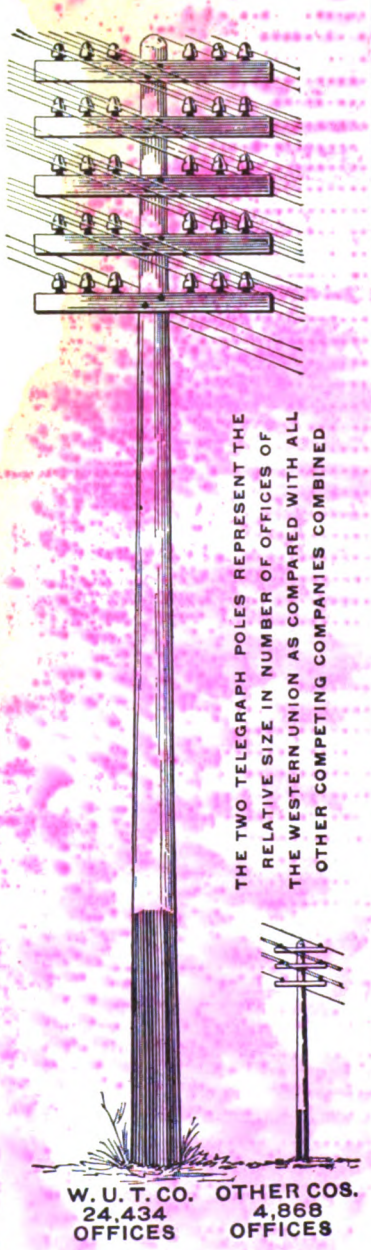

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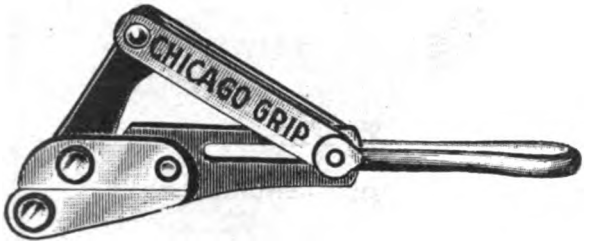

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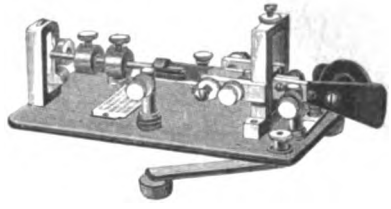

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No. 1. NEW YORK, JANUARY 1, 1908. Twenty-fifth Year.

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George H. Usher, general superintendent of the Postal Telegraph-Cable Company, at Atlanta, Ga., was a New York visitor during the holidays.

William H. Young, night manager of the Western Union Telegraph Company, Washington, D. C., contributed an interesting article to the Illustrated Sunday Magazine in its issue of December 15, under the expressive title of "Tales of Newspaper Row," a reference having its location in the capital city. No man possesses a wider range of acquaintance among newspaper men and incidents of their calling while serving as correspondents at Washington, than Mr. Young. His own personal services in the telegraph at the capital, date back to the early fifties, and his fund of reminiscent information upon which he is enabled to draw so liberally, is always at full tide and never lacking in interest.

Our enemies deserve our greatest attention always, sometimes our extreme respect; from them comes amendment and correction.

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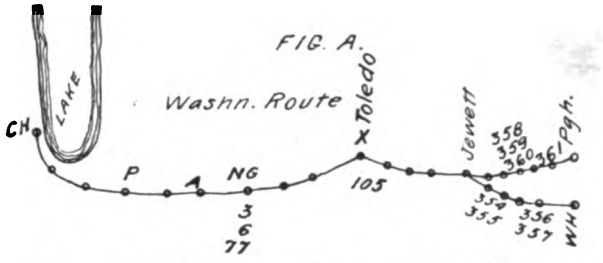
SOME POINTS ON ELECTRICITY.

How to Become a Wire Chief—A Few Suggestions for Beginners.

BY WILLIS H. JONES.

The practical reorganization of the force which has occurred in many of the large telegraph offices throughout the country resulting from the recent voluntary and involuntary shifting about of employees from old to new quarters, has naturally made it necessary to utilize a great deal of new material in the way of providing wire chiefs to fill the various vacancies. For the benefit of such persons the writer will endeavor to give a little rough information which may be of great benefit in the way of helping a beginner to acquire a rapid knowledge of the duties and requirements of a wire chief.



Assuming that he has had but little or no experience in that line his first duty is to study carefully the geography of the country, and especially the routes of the various railroads along which the wires are strung. He should ascertain particularly the various points at which certain wires branch off from the trunk line to follow the course of another road in order to reach a different locality. In this way the mind will picture the main and side lines somewhat in the form of a tree, the bulk of the wires composing the large trunk or body, up to the point or points where the irregular circuits branch off in other directions in order to reach a different locality. The latter, of course, represent the limbs of the tree. The picture may not show the symmetrical proportions of a respectable tree, but the symbol is certainly quite appropriate.

For example see Fig. A of the accompanying diagram, showing roughly the route of, say, the Wabash Railroad out of Chicago, Ill.

In the switchboard all wires strung along that road have the prefix Wab. placed before their respective number. Other prefixes, in like manner, of course, indicate the route of a different set of wires. Figure A not only shows the route of the Wabash wires, but also the calls of the principal testing stations along the road. It also shows where some of the wires diverge and hence take different routes. By arranging the numbers of these diverging wires on the chart in the positions shown in the diagram the different groups with their respective routes and terminals may be easily traced and memorized.

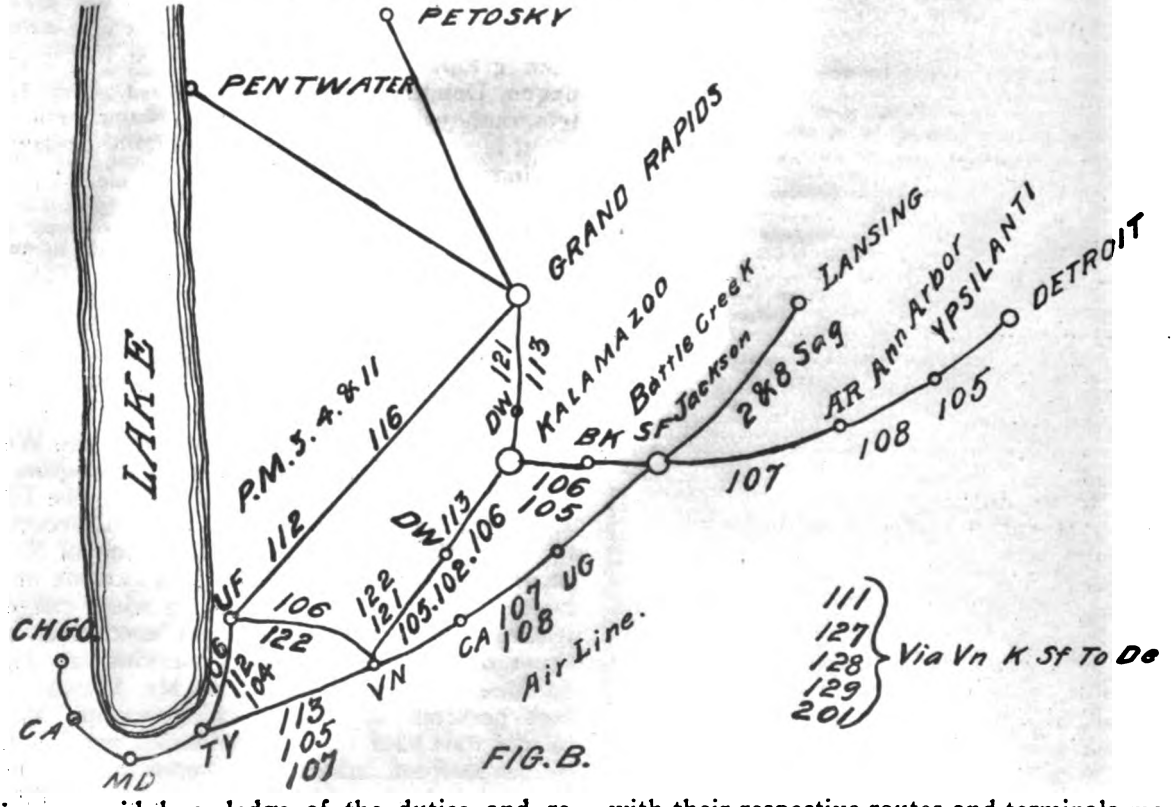


Figure A, therefore, means that all wires in the board bearing the prefix "Wab." begin at Chicago and are companion circuits along that particular railroad through all stations as far as they follow that route. In this case all the wires

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marked in the diagram are companions as far as station "N. G.," the point where those wires bearing the numbers shown below the letters N. G. terminate. The remaining wires continue companions as far as Jewett, where they separate, one group going over a different road to Wheeling and the other to Pittsburg. The figures 105 underneath "Toledo" indicate that wire No. 105 terminates at that point.

By one glance at the numbers and positions of the various groups of wires on a small chart of this kind one readily acquires a rapid and correct knowledge of their respective routes, lengths and terminal points.

In like manner Figure B gives a bird's-eye view of the routes of the Michigan Central Railroad wires, which bear the prefix MC to their numbers. This diagram is more complex than that of Figure A, because the wires take so many different routes in reaching their respective terminals, but the method of tracing them is the same. They all start out together, but their numbers need not be indicated on the chart except at such point or points where they leave the main line, or the diagram might leave one in doubt as to which of two possible routes a wire or number of wires follow from a junction of roads.

The notations on the chart may be made to suit one's individual fancy. Any mark that will assist the memory is all that is required. A self-made map or diagram of this kind soon becomes permanently pictured in the mind, and thus lays the entire field before one's eyes in the shortest possible time.

COMBINATION CIRCUITS.

Sometimes a circuit, particularly in the case of way wires, consists of a combination of parts of two or more wires connected together at some station or stations in order to include a city or town not on the original route. Thus a wire, say, between Chicago and Buffalo, following the Lake Shore Railroad could not include Detroit in one circuit as an intermediate point, but by cutting, or rather dividing the wire, say, at Jackson, Mich., and connecting the west end of it to the east end of another Chicago-Buffalo circuit at Jackson which runs through Detroit, we get to the same destination (Buffalo), with a continuous wire which does include Detroit. The other ends of the two divided wires may then be joined together in like manner and thus restore the other circuits between Chicago and Buffalo. When such connections are permanent the circuit is called a combination circuit, and a wire chief should not only memorize both numbers the circuit bears, but the point at which the two numbers meet.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 872,824, for electric telegraphy, has been granted to Isidor Kitsee, of Philadelphia. Two lines are provided with polarized relays and an electromagnet and are thus adapted to receive reversals, translate them into Morse characters and transmit them to the second line.

A patent No. 873,042, for an apparatus for receiving and strengthening the reproduction of messages, signals, etc., has been awarded to Emil S. Hagemann, of Copenhagen, Denmark. This telegraphone apparatus comprises telephone transmitting and receiving circuits, between which is an instrument for recording the message and simultaneously reproducing it in an augmented manner in the receiving circuit.

A patent, No. 873,078, for an electromagnet for telegraphone purposes, has been issued to Peder O. Pedersen and Valdemar Poulsen, Copenhagen, Denmark. This magnet is for the recording body of a telegraphone and has its poles applied thereto in a line oblique to the direction of motion thereof.

A patent No. 873,083, for a telegraphone, has been taken out by Valdemar Poulsen and Peder O. Pedersen, of Copenhagen, Denmark. The magnetic record on the recording body is obliterated by uniformly magnetizing the body and then remagnetizing it in the opposite direction. It thus becomes ready to receive a new message.

A patent No. 873,084, for a telegraphone, has been granted to Valdemar Poulsen, of Copenhagen, Denmark. A record-receiving body for a telegraphone consists of a sheet of magnetic material in the form of a cylinder and has means for tracing magnetic lines throughout its surface.

The following patents have expired:

Patent No. 442,139, for a multiple telegraph or telephone, held by A. M. Rosebrugh, of Toronto, Ont.

Patent No. 442,267, for telegraphy, held by E. B. Ives, of New York.

Patent No. 442,497, for printing telegraph, held by W. W. Taylor, of Mansfield, Mass.

Personal.

Sir Oliver Lodge has accepted the presidency of the Faraday Society, London, England, in succession to the late Sir William Perkin.

Mr. Charles Blizzard, third vice-president of the Electric Storage Battery Company, Philadelphia, read a paper on "Development in Storage Battery Practice" before the Telephone Society of New York on Nov. 26. The subject is one with which Mr. Blizzard enjoys a most intimate familiarity, from long experience in all departments.

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Western Union Telegraph Company.

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CUBAN AGENCY.

Eugenio Fortun y Varona, Manager, Havana.

Mr. John A. Hill, assistant superintendent at New York, recently received the third degree in Masonry. Many of Mr. Hill's telegraph associates witnessed the raising ceremonies.

Mr. S. C. Mason, a forty-niner of the telegraph, and who has been prominent in telegraph circles in Chicago for many years, has resigned his position as storekeeper of this company and has retired from active business.

At the annual meeting of the stockholders of the Southern and Atlantic Telegraph Company, G. W. E. Atkins was elected a director. Other directors were reelected.

This company's office at San Francisco, was removed on November 10 to a new five-story building at Pine and Montgomery streets, a point across the street from its former location. The operating room is located on the fifth floor, with the exception of the Wheatstone department which is on the fourth floor. The entire building with the exception of a few rooms is occupied by the telegraph company and everything pertaining to the equipment is new and strictly up-to-date.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

For the purpose of perfecting the organization, effecting economies and to facilitate the handling of business and correspondence, the following changes in the official staff have been ordered made, as of January 1, 1908.

The traffic department will be separated from the electrical engineer's department, and S. B. Haig has been appointed superintendent of traffic, with headquarters in New York.

Charles Shirley has resigned as superintendent of city offices, New York city, and has been appointed assistant superintendent of traffic, with headquarters in New York.

The position of superintendent, leased wire department, will be abolished, and everything pertaining to leased wires formerly looked after by Superintendent H. F. Hawkins, will be handled by the superintendent of traffic.

The position of superintendent, commercial news department, will be abolished. The traffic

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features formerly taken care of by John Costelloe, will be handled by the superintendent of traffic. All correspondence in reference to rates, reports, accounting, etc., should be referred to the superintendent of tariffs.

H. F. Hawkins has resigned as superintendent, leased wire department, and has been appointed assistant secretary of the company.

EASTERN DIVISION.

E. B. Pillsbury has been appointed division superintendent, with headquarters in New York city.

C. F. Leonard has been appointed superintendent, city offices, New York city, vice Charles Shirley, transferred.

The seventh district will be merged with the first, and A. L. Edgecomb, now superintendent at Portland, will be transferred to Boston, and as superintendent will have charge of the enlarged first district.

The eighth district will be merged with the second. E. Kimmey, of New York, will be superintendent of the enlarged second district.

Richard P. Martin, now superintendent of the eighth district, at Hartford, Conn., will be made manager of the Hartford office.

WESTERN DIVISION.

T. W. Carroll has been appointed division superintendent, with headquarters at Chicago.

The ninth district will be merged with the first, and H. G. McGill, now superintendent at Milwaukee, will be transferred to Chicago, and as superintendent will have charge of the enlarged first district.

The lines and offices from Terre Haute to Indianapolis, Ind., but not including Indianapolis, and the lines and offices from Terre Haute to and including Evansville, and the line from Indianapolis to the end of the cable on the Kentucky side of the Ohio River, at Louisville, will be transferred from the first district to the third district, under the jurisdiction of S. H. Mudge, superintendent, St. Louis, Mo.

The lines and offices of the Illinois Central and the Yazoo and Mississippi Valley Railroad will be transferred from the southern division to the western division, except the city offices along these lines, which will continue in the southern division, as at present.

F. W. Conger, superintendent city offices, Chicago, will have entire charge of Chicago main and branch offices.

The title of J. F. Looney, assistant electrical engineer, will be changed to division electrical engineer.

SOUTHERN DIVISION.

Instead of eight districts as at present, there will be four, the latter to be arranged on strictly state lines.

First District, G. W. Ribble, superintendent, Richmond, Va., to comprise the states of Virginia, North Carolina and South Carolina.

Second District, G. E. Paine, assistant general superintendent, Atlanta, Ga., to comprise the states of Georgia and Florida, except the line from Mobile to Pensacola.

Third District, Jesse Hargrave, superintendent, Birmingham, Ala., to comprise the States of Alabama, Mississippi and Louisiana, and the short line from Mobile to Pensacola.

Fourth District, C. B. Arrington, superintendent, Nashville, Tenn., to comprise the States of Kentucky and Tennessee, including the line from Cairo, Ill., to Rives, Tenn.

The following districts to be abolished:

Third District, M. H. H. Duvall, superintendent, Augusta, Ga.

Fourth District, C. H. Groce, superintendent, Chicago, Ill.

Fifth District, W. J. Slater, superintendent, Louisville, Ky.

Sixth District, W. A. Porteous, superintendent, New Orleans, La.

Seventh District, C. B. Arrington, superintendent, Jacksonville, Fla.

Eighth District, C. A. Garland, superintendent, Memphis, Tenn.

The title of J. P. Edwards, assistant electrical engineer, will be changed to division electrical engineer.

PACIFIC DIVISION.

The title of H. C. Shaw, assistant electrical engineer, will be changed to division electrical engineer.

The following is a complete list of the directors and officers of the Postal Telegraph-Cable Company revised in accordance with authorized changes, in effect Jan. 1, 1908:

CLARENCE H. MACKAY, President.

VICE-PRESIDENTS.

Edward J. Nally, first vice-president and general manager.
Charles C. Adams, second vice-president.
Charles P. Bruch, third vice-president.
George G. Ward, fourth vice-president.

BOARD OF DIRECTORS.

ALBERT B. CHANDLER, Chairman.

Clarence H. Mackay	George G. Ward	Edward J. Nally
Charles R. Hosmer,	Edward C. Platt	Charles C. Adams
Charles P. Bruch	James W. Ellsworth	George Clapperton
	Edward Reynolds	

Edward C. Platt, treasurer.
Theodore L. Cuyler, Jr., asst. treas.
Edward Reynolds, auditor.
Isaac Smith, supt. of tariffs.
Walter D. Francis, supt. of supplies.
Minor M. Davis, electrical engineer.
John F. Skirrow, asso. elec. eng'r.
Fernand E. d'Humy, asst. elec. engineer.
John O. Stevens, secretary.
Henry F. Hawkins, asst. secy.
John Doran, supt. complaint and claim department.
Stephen B. Haig, supt. of traffic.
Charles Shirley, asst. supt. of traffic.
Christopher A. Rhodes, traveling auditor
Edward S. Butterfield, gen'l agent, money transfer service.

EASTERN DIVISION.

Edward G. Cochrane, general superintendent, New York.
Edward B. Pillsbury, division superintendent, New York.
Charles H. Lane, superintendent of construction, New York.

DISTRICT SUPERINTENDENTS.

1. Arthur L. Edgecomb, Boston.
2. Edson Kimmey, New York.
Christopher F. Leonard, supt. city offices, New York.
3. Leona Lemon, Philadelphia, Pa.
4. Harvey D. Reynolds, Buffalo.
5. Charles E. Bagley, Pittsburg, Pa.
6. Albert C. Kaufman, Albany, N.Y.

WESTERN DIVISION.

Welcome I. Capen, general superintendent, Chicago, Ill.
Thomas W. Carroll, division superintendent, Chicago, Ill.
Charles M. Baker, superintendent of construction, Chicago, Ill.
John F. Looney, division electrical engineer, Chicago, Ill.

DISTRICT SUPERINTENDENTS.

1. Hiram G. McGill, Chicago, Ill.
Frederick W. Conger, supt. city offices, Chicago, Ill.
2. Edgar W. Collins, Cleveland, O.
3. Solomon H. Mudge, St. Louis, Mo.
4. Henry J. Kinnucan, Detroit, Mich.
5. Alpheus B. Richards, Kansas City, Mo.
6. W. P. S. Hawk, Salt Lake City, Utah.
7. William C. Black, Denver, Col.
8. Charles F. Fox, Des Moines, Ia.

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SOUTHERN DIVISION.

George H. Usher, general superintendent, Atlanta, Ga.
Guy E. Paine, asst. general superintendent, Atlanta, Ga.
Benjamin S. Price, superintendent of construction, Atlanta, Ga.
James P. Edwards, division electrical engineer, Atlanta, Ga.

DISTRICT SUPERINTENDENTS.

1. Geo. W. Ribble, Richmond, Va.
2. Guy E. Paine, A. G. S., Atlanta, Ga.
3. Jesse Hargrave, Birmingham, Ala.
4. Chas. B. Arrington, Nashville, Tenn.

PACIFIC DIVISION.

Leonard W. Storror, general superintendent, San Francisco, Cal.
Jed G. Blake, asst. general superintendent, San Francisco, Cal.
Harry C. Shaw, division electrical engineer, San Francisco, Cal.

DISTRICT SUPERINTENDENTS.

1. William Hearn, San Francisco, Cal.
2. John A. Forehand, Seattle, Wash.
3. Chas. L. Lewis, Los Angeles, Cal.

LEGAL DEPARTMENT.

William W. Cook, general counsel, New York.
Loesch, Scofield & Loesch, general attorneys, Western division, Chicago, Ill.
W. B. Vansize, patent attorney and expert, New York.

Resignations and Appointments.

The following changes have occurred in the service of the Western Union Telegraph Company:

Mr. L. E. Rudd, manager at Jackson, Miss., has been appointed manager at Lexington, Ky., vice E. T. Moore, appointed manager at Knoxville, Tenn. J. H. Whitman of Corning, N. Y., has been appointed manager at Jackson, Miss., vice L. E. Rudd.

The following changes have occurred in the service of the Postal Telegraph-Cable Company:

Mr. C. H. Dougherty, of Richmond, Va., has been appointed manager at Greenville, N. C.

Mr. Maurice J. Kenyon of the American Telephone and Telegraph Company, formerly of New York, is now located at Chicago as representative of the leased wire department of that company.

The Railroad.

Mr. John A. Hulit, of Topeka, Kan., the inventor of the telegraph selector bearing his name, has been testing out his instrument on the Pennsylvania lines at Pittsburg.

Mr. D. C. Moon, who has just been appointed general manager of the entire Lake Shore and Michigan Southern Railroad system, with headquarters at Cleveland, O., began his career as a railroad telegraph operator.

A. H. Smith, vice-president and general manager of the New York Central Railroad Company, who was placed on trial as being responsible for the disaster of the express train on the Harlem division, was acquitted, in accordance with the order of the judge, who said that he did not consider Mr. Smith responsible for the accident.

At a meeting of the Pittsburg branch of the American Institute of Electrical Engineers, December 4, Mr. J. H. Schoeff, of the Westinghouse Electric and Manufacturing Company, abstracted Mr. Armstrong's New York paper, "Comparative Performance of Steam and Electric Locomotives," emphasizing important points. Among them was the fact that at higher speeds the electric locomotive develops comparatively more tractive effort than the steam locomotive; also that the electric locomotive figured better on mountain grades for hauling freight.

Radio-Telegraphy.

The Swiss military authorities have recently received, at a wireless station on the Righi, messages in a variety of languages, from unknown sources.

The Australian commonwealth government has decided to install wireless telegraph installations at a number of points round the coast, the successful tenderer being required to sell his Australian rights to the government.

The Kieff station of the wireless telegraph line the Russian government is constructing to connect Sebastopol with St. Petersburg, has picked up Marconi transatlantic messages, including a number of press despatches sent from the American side and also messages transmitted from Paris and Casablanca.

The government of British Guiana has authorized the West India and Panama Telegraph Company to provide wireless telegraphic communication between Georgetown and Port of Spain, the cable system being unreliable owing to the local conditions. The government bears no part of the cost, but has agreed to continue the payment of the subsidy of £3,000 a year for five years.

It is stated that a project for establishing a system of wireless telegraphy between Vancouver and New Zealand and Australia is being considered by the British government. It is the outgrowth of a proposition to connect the various British islands in the South Pacific. Mr. F. J. Cross, an American electrical engineer, says the project is quite feasible and that he was commissioned last July to report on it. He returned recently on the steamer "Aorangi" from the Fiji Islands. His report is now en route to Winston Churchill, the colonial secretary in the Imperial government. The only station on foreign soil may be located at Honolulu. The entire cost is estimated at less than $500,000. Mr. Cross says: "In the alternative scheme stations will be established in the Samoan group, now occupied by three powers, and the Marquesas Islands, owned by France. The British islands to be hooked up include Fanning Island, Tonga group, the Fiji group, and Ellice Island. From Fiji to New Zealand, the distance is about 1,540 miles, and from Fiji to Brisbane the distance is less."

Mr. J. L. Kollorohs, of Bowling Green, Ky., in renewing his subscription for the ensuing year, remarks: "Telegraph Age is a paper that an up-to-date and wide awake operator cannot do without. Its pages are newsy and full of interest and keep abreast with the science of the craft".

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The Belin System for the Electrical Transmission of Photographs.

(Abstracted by the Electrical Magazine, London, from an article in the British Journal of Photography.)

The French scientist, M. Edouard Belin, of Nancy, has been engaged with the question of the electrical transmission of photographs, and the interview and demonstration which he afforded at the Société Française de la Photographie, Paris, inspire confidence that a very considerable advance has been made. M. Belin has made himself expert in sensitometric problems, and it is these studies which have led him, he claims, to the solution of some of the most important problems in technical photography: transmission of a given photograph by wire, a self-registering opacity meter, a registering sensitometer, and last, not least, the transmission by wire of the image of any given person, object, or proof. The last problem, not to be confounded with the first, is the one M. Belin has been longest devoted to, but, having put it aside for the others, its solution is not complete. None the less, he is confident of success, and that fairly soon. The first question M. Belin claims to have completely solved in a manner fulfilling certain stringent conditions. These are:

1. That the image received should be of precisely the same dimensions as that transmitted.

2. That they should be reproduced, or reduced, or enlarged if desired, but the detail should remain on the same scale as if the original size were preserved.

3. That whatever the original, a positive or negative image can be formed at will at the receiver. The value of this for photo-mechanical processes is obvious. The nature of the original is simply telephoned to the receiving station, when adjustment is made accordingly.

4. Further, the image received shall be of the same intensity as the original, or, if desired, can be intensified or reduced. And this is obtained by no subsequent chemical treatment, but during transmission by a simple physical adjustment.

It now remains to describe the apparatus which performs these marvels. The complete model installation, containing transmitter, receiver, motor, and a resistance line of 4,000 ohms, equivalent to several hundred kilometers, is mounted on a stand about a meter square.

The method adopted is entirely different from that of the Korn system, which utilizes the varying electrical resistance of selenium when exposed to light. Belin calls his procedure "Telestereography," or transmission of a relief to a distance, and one essential lies in the use of a carbon print as the original transmitted, such a print being, of course, a relief in which the contours are proportional to the intensities of the image.

This print is wound on the cylinder of the transmitter. In perfect synchronism with this revolves the cylinder of the receiver, the synchronism being effected by the use of an alternating current. As the cylinder revolves a small point or style in contact with it moves along the axis, which is geared on to the cylinder or drum. The conditions chosen are such that the print advances lineally one mm. for six turns of the cylinder, from which results that detail down to one-sixth mm. is faithfully reproduced. The movements of the point or style are transmitted by an arm to a small sliding contact or roulette, working on a minute rheostat. This rheostat consists of twenty very small plates of copper separated by layers of mica and each branching off to a resistance coil.* There are thus twenty variations of the intensity of the current possible. At the commencement, before the alteration introduced by the cylinder, there is simply a large resistance of 4,000 ohms, the movement of the transmitting cylinder and the style then call into play the variations, always according to the contours of the carbon image, and hence in proportion to the values of light and shade.

The variations in the current of the circuit, proportional as they are to the intensities of the image, are registered by the delicate reflecting galvanometer of Blondel, known as the oscillograph. This instrument will respond to variations of current at a frequency of 50,000 per second.

The disposition which enables the registration as a photograph to be effected of these electric fluctuations is thus explained. An aplanatic lens throws an image of the reflected ray from the mirror on to a small hole, this hole being one-sixth mm. in diameter. Behind this minute hole revolves the second synchronized receiving cylinder, on which is a photo-sensitive surface. The hole is so near the film as practically to be in contact with it so that any diffusion of light is avoided. In other words an image of the hole is continuously printed on the film, and this means that detail is preserved to one-sixth mm. Under these conditions, there would still be no variation of the light intensity. The way this is effected—that is, the method by which the deviations of the galvanometer are converted into light intensities—is ingenious. Behind the lens is a scale of tones, that is, of densities (in the sense of Hurter and Driffield), increasing from bare glass to a certain value; in fact, an optical wedge. Various ways of producing this optical wedge may be employed: at present M. Belin uses a photographic plate specially exposed. The scale of densities increases in proportion to the mirror deviations, that is, to the intensities of the current, and the more (or less) it is absorbed, so that the hole is illuminated by light varying in intensity with the intensities of the original image. The density scale is mounted on a revolving axis, so that according to the direction of increase of density, relative to the mirror deviations, a positive or

* M. Belin explained that he had chosen a range of 1-20 as representing the possible range of contrast in photo-mechanical processes.

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negative image can be obtained at will on the receiving film, fulfilling the third condition mentioned at the start.

Again, if instead of a scale of tones corresponding to those of the original, one of harder or softer gradation be substituted, the image may be obtained reduced or strengthened in intensity and by purely physical means.

It must be confessed that both the ingenuity and the comparative simplicity of the apparatus make it very promising. The results obtainable at present are very fair, and M. Belin hopes by certain slight modifications, such as a refinement of the rheostat and the cursive point, to greatly improve the rendering. In two or three weeks, with the promised aid of the State telegraph lines, he hopes to give a public demonstration of its capabilities over long distances, an event which will be awaited with much interest. M. Belin states that he can also transmit writing in relief by his instrument, and that the question of speed is one chiefly conditioned by the fineness and perfection of mechanical and electrical details. At present the transmission of a nine cm. by twelve cm. image occupies about thirty minutes.

As to the more romantic problem of simultaneously photographing and transmitting the image of any object, scene, or person, M. Belin would only state that the idea involved was entirely different from that sketched herewith.

How President Lincoln Taught Little Tad to Signal at His Office Door.

In the Wilderness chapter of Mr. David Homer Bates's book, "Lincoln in the Telegraph Office" (which is an expansion of the papers printed in The Century), reference is made to the fact that the first news of Grant's initial Eastern battle was brought to Lincoln by Henry E. Wing, then a New York Tribune correspondent (now the Rev. Henry E. Wing of South Norwalk, Conn.). Since the appearance of the volume he has written to Mr. Bates, as follows, with reference to the chapter, which in the September Century was entitled "Lincoln's Family Relations":

"Your 'Lincoln in the Telegraph Office' is one of the most valuable collections of authentic personal incidents in the life of that great man that have ever been published. Some of the chapters relating to public affairs have great historic interest, but the one that pleases me most is the chapter on 'Lincoln's Love for his Children.'

"I witnessed an incident in his family life that made a wonderful impression upon me, and which belongs in the account of Lincoln's relations with the telegraph, because of the use of Morse dots and dashes in a private signal between the father and his favorite child.

"At Lincoln's request, made at my early morning interview with him on May 7, 1864, when I brought the first authentic news from Grant's Wilderness fight, I always went to see him when I came from the front.

"In the summer of that year I was at the White House late one night, with my field maps spread out on the table, explaining some details of one of Grant's battles, when my attention was distracted by a gentle knocking on the panel of the door, to which the President gave no heed. Then the door-knob was rattled and a childish voice called, 'Unfasten the door.' Lincoln thereupon rose and drew the bolt, and little Tad (then ten years old), in his nightgown, bounced in, jumped upon his father's lap, and threw his arms about his neck.

"The little fellow, I afterward learned, was in the habit, if he awoke in the night, of creeping into his father's bed; but, on this occasion, not finding him, had come over to the office, which was on the same floor.

"Lincoln, with his boy upon his knee, began with patience to teach him to make a certain signal by tapping on the desk with Tad's fist doubled up in the father's big bony hand.

"There were three quick raps, followed by two slower ones, thus — — — —— —— and over and over again these dots and dashes were sounded on the desk until Tad made the signal correctly without his father's help.

"It appears that the child had before been taught to make this signal on the office door whenever he wanted to come in, and that no matter how busy Lincoln might be or with whom he was closeted, Tad could thus always gain admission. But on this occasion he had forgotten the signal, and so his father paid no attention to the disturbance until he heard his child's voice."—The Century Magazine.

Telegraph on Horseback.

An ingenious device by which the horse is made a part of an electrical circuit, has been reported to the War Department by Lieut. A. C. Knowles, Thirteenth Infantry, at Fort Leavenworth, Kan., who has been making tests intended to permit telegraphic and telephonic communications between mounted operators. This will permit the mounted operator to transmit messages to his base wherever necessary without stopping his horse. This is accomplished by placing a small piece of copper, connected to the telegraph or telephone instrument, against the animal's body, thus completing a ground connection through the horse's hoofs. The tests were made over all kinds of ground and conversation was carried on without difficulty between two operators separated by five miles, the horses standing in the grass.

"Sketches Old and New," by Walter P. Phillips, is a handsomely bound volume of 164 pages of interesting and charmingly told telegraph stories; one of the very best works of the kind ever published, and which will appeal strongly to every telegrapher; price, $1.

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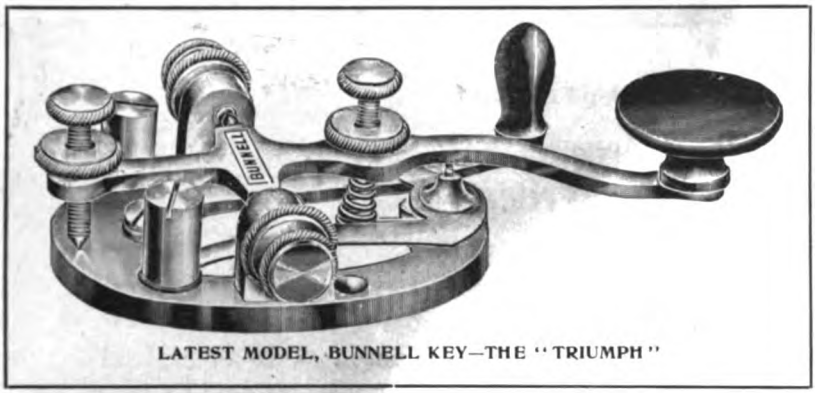

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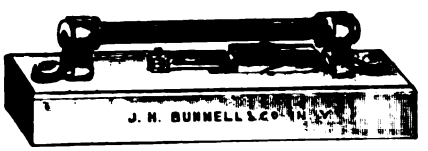

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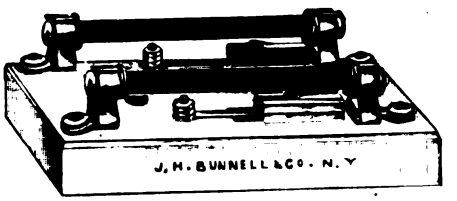

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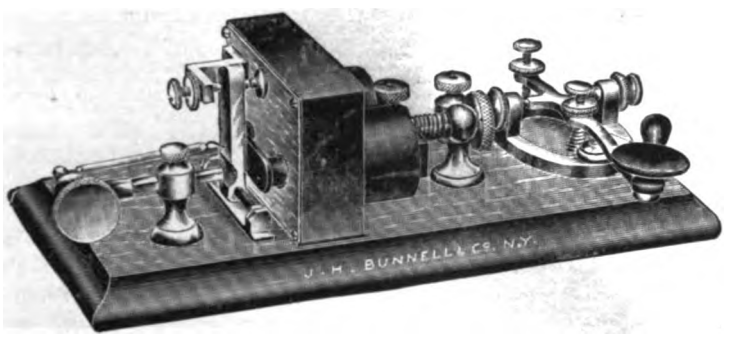

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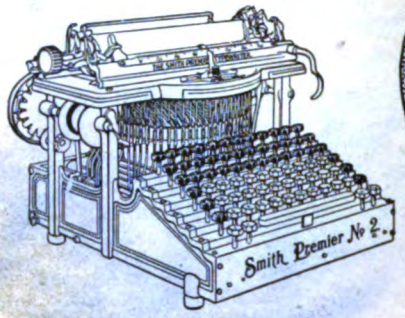

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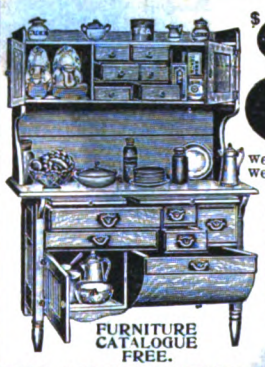
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REMITTANCES to Telegraph Age should be made invariably by draft on New York, postal or express money-order, and never by cash loosely enclosed in an envelope. By the latter method money is liable to be lost, and if so remitted is at the risk of the sender.

NEW YORK, JANUARY 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The Death of Lord Kelvin.

In the death of Lord Kelvin, which occurred December 16, an obituary notice of whom is published elsewhere in this issue, the telegraph profession loses its most eminent member. Nothing that we could say could better express the estimate of worth of the great man who has passed away than the tribute to his eminent abilities uttered by Mr. Edison:

"Lord Kelvin certainly had the master mind in science, for the world seldom sees such a man as he was. First of all, he was great as a mathematician, and then he developed into the greatest of scientists. I think it is safe to say that he gave more attention to such subjects as the power of the tides and the properties of the crust of the earth than any other scientist. Kelvin may truly be said to have been the life and soul of the Atlantic cable, and they are still using the instruments which he invented so many years ago. It is a matter of history that he was also identified with practically all the other great cables which have been laid. When he was completing the modern mariners' compass, I felt greatly flattered when he called upon me to take some of the readings from the improved instrument."

Twenty-five Years.

It is with becoming modesty that Telegraph Age announces its twenty-fifth year, and tenders this anniversary number to its readers. In contemplation twenty-five years is a long look ahead; in retrospect the time seems to shrink to far narrower proportions. Yet the past quarter of a century in which this journal has had its life, and during which it has been able to contribute a share to the thought and expression in the great realm of telegraphy, for which it has stood the exponent, marvelous changes record the development and progress made in the general electrical field. A comparison of conditions as they existed twenty-five years ago, with those with which we are familiar to-day opens a vista for thought, for profound contemplation. The revelation of what man is capable is awe-inspiring; it discloses the God-like attributes of mind that possess the human race. We are, indeed, "Living in a grand and awful time." During the period referred to the telegraph has widely extended its reaches. The world is gridironed by its lines; it traverses under sea in all directions, and in newer form is already transmitting messages through the air without wires. The news and information of the world is more immediately at our disposal than ever before.

The span of twenty-five years entitles Telegraph Age to rank with the oldest of the electrical technical journals. With but one or two exceptions it is the senior of all. In surveying a field in which there is so much to arouse enthusiasm, to stimulate thought and encourage endeavor, the editors of Telegraph Age feel new hope and courage for the pursuit of their own course. They have at least the consciousness of having tried to furnish their readers with a telegraphic newspaper that keeps abreast of the times, and in advocating measures that they believe to be right.

In presenting in this issue the large number of engravings, showing well-known faces embraced within the scope of the telegraph, many of them of men of conspicuous reputation, it will be observed that included in the list are those of the general managers of every individual telegraph company in the United States and Canada.

We desire to thank our friends for their kindly co-operation and aid in contributing to make this number the interesting and successful issue it is. There has been a loyalty among the readers of Telegraph Age and a heartiness of expression manifest for its welfare, especially of late, that has been thoroughly appreciated by its conductors, and no occasion is more opportune than the present to acknowledge this tribute of esteem, of confidence and even of affection that has been poured in upon us in such generous measure.

Telegraph Age wishes its readers a Happy New Year!

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Telegraph Messages Not Commodities.

Attorney General Jackson, of New York, learned of certain contracts and arrangements between the Western Union and Postal telegraph companies. Concluding that they were in restraint of trade and in violation of the Donnelly anti-trust act, he brought suit against the companies. He obtained an order from Justice Platzek compelling directors of both companies to appear before a referee and give testimony as to those contracts and arrangements. The two companies had denied that a merger was contemplated. The order was, therefore, contested on a motion to vacate it before Justice Hendrick. December 21 the motion was granted.

In his opinion the justice says the vital question to be determined is whether or not a telegraph company produces and sells a commodity in common use, such as comes within the prohibition of the Donnelly act. He concedes that it does not. He finds that the telegraph companies here are not included in the act and if they were, is quite certain that the transmission of a message from one point to another does not make the message so transmitted a commodity within the meaning of the act.

The justice further asserts that the reasons urged by the attorney general might be laid before the legislature as arguments for the enactment of laws to correct any evils which may exist, but do not touch existing law.

Andrew Carnegie, the Father of the United States Military Telegraph Corps.

On the menu card of the never-to-be-forgotten dinner of the surviving members of the United States Military Telegraph Corps at the Hotel Manhattan, New York, March 27, 1907, Mr. Carnegie was called the "Father of the Corps," because of his appointment as assistant general manager of government telegraphs in April, 1861, and of his having called into being the organization which rendered such skilful and valiant service during the Civil War. David Homer Bates and Richard O'Brien, the two survivors of the "Original Four" operators who went to Washington in April, 1861, in response to Mr. Carnegie's telegram of April 22, 1861, to David McCargo, superintendent of telegraphs, Pennsylvania Railroad, calling for operators for government service, were present at that memorable dinner. When the toastmaster, Mr. Bates, introduced Mr. Carnegie he recalled to his memory the telegram to Mr. McCargo and the latter's reply, whereupon Mr. Carnegie responded with tears in his eyes:

"Comrades, not more than once or twice in a man's life is it given to him to live as I have been living while hearing those despatches read by Mr. Bates. They carry me back—back—back, almost to the very beginning of my career." Here Mr. Carnegie's recollections almost got the metter of him. He tried to go on, but there was a lump that rose in his throat and his voice became husky and broken when he had recovered he went on with a rush. "Well, it is a proud moment. I have not lived in vain if it has been given to me in vindication of the great principle of manhood of humanity to be of some service to a government like this, where every man has equal privileges and equal rights."

After Mr. Carnegie went to Scotland for his usual summer sojourn, Mr. Bates wrote him that under the provisions of the Act of Congress approved by Grover Cleveland January 26, 1897, he was entitled to a certificate of honorable service in the military telegraph branch of the United States army. The application which Mr. Carnegie signed and forwarded to the War Department, upon his return from abroad in November last, was refused on the ground that the records of the department failed to show that he had rendered or had received pay for any such service. It did not seem right that because the War Department records were defective our chief comrade should be deprived of his certificate, and accordingly the claim was strengthened by the testimony of Colonel William Bender Wilson, president of the United States Military Telegraph Corps (who was also called to Washington by Mr. Carnegie in 1861, arriving there May 2, and who served as manager of the War Department telegraph office until March, 1862). In addition, supporting affidavits were procured from Messrs. Bates and O'Brien, and we are glad to inform the readers of Telegraph Age that the justice of Mr. Carnegie's claim for a certificate of honorable service under the Act of January 26, 1897, has now been recognized by the Secretary of War and the certificate has been granted.

Pensions for the Members of the United States Military Telegraph Corps.

Hon. William Lorimer, of Illinois, has introduced and will champion in the national House of Representatives the following bill:

A bill, extending the provisions of the pension laws of the United States to persons engaged in the operation and construction of military telegraph lines during the war of the rebellion.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all persons placed upon the roll of military telegraph operators under the provisions of an Act approved January 26, 1897, entitled "An Act for the relief of telegraph operators who served in the war of the rebellion," and who have been granted suitable certificates of honorable service as provided in said Act, are hereby declared to have been a part of the Army of the United States; and the provisions of all laws granting pensions to the officers and enlisted men who served in the war of the rebellion, their widows, minor children, and dependent relatives, are hereby extended so as to apply to the said persons: Provided, That the

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rates of pensions hereunto shall be the same as that granted to private soldiers."

The bill was referred to the Committee on Invalid Pensions, of which Hon. Cyrus A. Sulloway is chairman.

It is desirable that all members of the corps and their friends should secure the support of their Congressmen for the bill. Mr. Andrew Carnegie, who was the founder of the corps and is proud of its achievements, will add his efforts to secure the passage of the bill. Mr. Carnegie's deep interest in the measure is shown by his noble-hearted action in creating an "Honor Pension Roll," to which shall be eligible living members of the corps who have been or who may be granted suitable certificates of honorable service, provided for in the Act of Congress approved January 26, 1897. This "Honor Pension Roll" will continue in force until Congress provides for placing the members of the corps upon the pension rolls of the government. All applicants for the Carnegie pension should apply through the executive committee of the United States Military Telegraph Corps; applications to be addressed to Colonel William Bender Wilson, president, Holmesburg, Philadelphia, Pa., or Mr. David Homer Bates, secretary of the executive committee, 658 Broadway, New York.

Communications From the Naval Fleet.

From the ships of the naval fleet, now on its way to the Pacific Coast, the greatest precautions will be taken to prevent any information from reaching the outside world, except through the Navy Department. Half a dozen newspaper reporters, who will be permitted to accompany the expedition, have been pledged to send to their newspapers or the distributing agencies only such information as shall be approved by the fleet censors. The conditions imposed on them will prevent them from conveying to a foreign power through the newspaper intelligence regarding the actual equipment, operation and accomplishment in the way of experimental work on any of the warships. No detailed account of the "peace mission" will be countenanced until its conclusion.

On the elevated bridge from which Admiral Evans will direct the maneuvers of his fleet, an intricate system of signals will be manipulated. In the day time flags and semaphores are used in signaling orders to the other vessels of the fleet. At night when the outlines of each of the warships is traced in electric lights a system of electric light signals winks orders in dots and dashes much after the manner followed in cable stations, where the mirror is used. It is a pretty picture these lights make when in operation. The operator of them winks a call to some other ship and follows is up by calling the others until pretty soon every ship is winking its reception of or response to an order. Each ship is equipped with a duplicate system of signals as well as a wireless telephone and wireless telegraph apparatus.

Book Review

Now that matters in the telegraph world are settling down once more on a rational basis it must soon become apparent to the thoughtful men in the profession that there is no more rapid way to advancement for the individual than to acquire a thorough working knowledge of electricity and magnetism and of the systems and apparatus employed in telegraphy. Sometimes men are deterred from undertaking the necessary study for this purpose in the belief that a college course, or at least a correspondence school course, is essential therefor. This view, however, is not well based, since an opportunity to acquire this knowledge at small cost is fortunately presented in Maver's "American Telegraphy and Encyclopedia of the Telegraph," a fact which hundreds of students of this work have freely attested, and many of whom have acknowledged the assistance which it has afforded them in attaining the advanced technical positions which they now hold. "American Telegraphy" is indeed admitted to be a very good substitute for a college course in telegraph engineering, and the operator who may master its contents will find himself well prepared to fill any technical position within the scope of telegraph engineering. Concerning this book Mr. F. B. Crocker, professor of electrical engineering at Columbia University, of New York, has written: "I often say to my students and others it is one of the very few electrical books which is thoroughly satisfactory. Its clearness and completeness are remarkable, and yet it is not voluminous." Regarding this book also no less an authority than E. J. Nally, vice-president and general manager of the Postal Telegraph-Cable Company, wrote in an article in the Saturday Evening Post addressed to beginners in the telegraph business: "Easily first of the standard books which the young telegrapher should read is William Maver's treatise on 'American Telegraphy.' This is a meaty volume of some 500 pages (now 656 pages), which deals in a most comprehensive way with all phases of the telegraph art as it obtains on this continent." Copies of this valuable book will be forwarded on receipt of the price, $5, by addressing J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Mr. J. P. Spanier, the general agent of the Western Union Telegraph Company's cable service at Naples, Italy, from which point he represents his company's interests in Italy, Southern France, Switzerland, Russia, all of southeastern Europe, Egypt and other North African countries, in renewing his subscription recently, takes occasion to express his appreciation of Telegraph Age which he says, "I read with much attention and find very interesting indeed, keeping me as it does in close touch with the telegraph situation in America."

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Death of Lord Kelvin.

William Thomson, first Lord Kelvin, the noted scientist, died at Glasgow, Scotland, December 16, 1907.

The famous man of science whose death is announced in the foregoing despatch began life without a title or any heritage but that of brains. William Thomson's ancestors for several generations lived in the North of Ireland, though they had a Scotch derivation. His father, born on a farm, showed a passion for science at an early age, and is said to have learned how to make a sun dial for any latitude when only eleven years old. The elder Thomson (James) was educated at the old College of Glasgow, was appointed professor of mathematics in an institute in Belfast (where William was born on June 25, 1824), and in 1832 complied with a request to make his Alma Mater the scene of his activities, which were still devoted to the same class of instruction. From that day onward, in spite of numerous temporary absences, Glasgow remained the home of his distinguished son. William received a part of his education directly from his father and a little of it from the institution to which the latter had been called. Subsequently he entered St. Peter's College, Cambridge, where he was graduated in 1845. He won notable honors there, being first Smith's prizeman of his year as well as second wrangler. It is believed that the senior wrangler owed his triumph to facility in writing, for one of the examiners was heard to say that he was "unworthy to cut Thomson's pencils for him." Nor was intellectual pre-eminence achieved at the sacrifice of physical well-being. Thomson was devoted to athletics while at Cambridge, and rowed in the winning boat in a race with Oxford.

At the age of twenty-two, and only a year after his graduation, the young scientist was chosen professor of natural history in the University of Glasgow, after having spent several months in the laboratory of Regnault, in Paris. Repeated invitations were afterward given to him to assume similar posts elsewhere, but his loyalty to the great city on the Clyde remained unshaken. In 1896, three years before terminating his service there and exactly half a century after his appointment, he received a wonderful tribute of admiration and affection. The university and civil authorities of Glasgow, the leading scientific societies of America and Europe and many individuals who were themselves distinguished (including the Prince and Princess of Wales) united in that demonstration. By personal presence, by formal address, by letters, telegrams and cable messages, they made his jubilee celebration an event practically without a parallel in the history of science. Lord Kelvin was elected chancellor of the university in 1904.

One of the first great enterprises with which Professor Thomson was identified was that which has made the name of Cyrus W. Field memorable. Electric signals sent through a submarine cable were found to undergo a peculiar retardation that threatened to blur them beyond recognition. Faraday had long before furnished a partial key to the evil, but Thomson supplied the remedy. By his advice it was made possible to design a cable so that a reasonably satisfactory clearness and speed could be secured. The correctness of his statement of the laws involved was disputed by an electrician of the cable company, Dr. Wildman Whitehouse, but the Glasgow expert disposed of the argument so effectively that he was retained on the spot as consulting engineer. He officiated in that capacity both for the cable of 1858 and that of 1866. He was also electrical engineer for the French Atlantic cable in 1869; the Brazilian and River Plate cable in 1873; the West Indian cables in 1875, and the Mackay-Bennett Atlantic cable in 1879.

He contributed to the success of these enterprises in several other ways. He prescribed a method of testing the conductivity of a submarine wire while it was being laid, in order that any defect might be promptly discovered and cured. He also invented instruments wherewith to receive messages. Those employed for land wires were not sensitive enough. Thomson so mounted a mirror on a tiny magnet that the feeble electric impulses which traversed a cable would cause it to sway. A beam of light was thus deflected, first to the right and then to the left, on a blank white wall in a dark room. The magnet was suspended by a silk fibre, and its movements were practically unimpeded by friction. This invention was supplemented by one which would leave a permanent trace on a strip of paper. It was called "the siphon recorder." Use was made of it to receive some of the greetings sent to its author in 1896. Without question he did more than any other scientific man to promote submarine telegraphy, and that was the cause of his being knighted in 1866. Subsequently he devised a sending key for use with a cable, and he did much to perfect apparatus for taking deep sea soundings, while a ship was under way, thus greatly facilitating the exploration of cable routes.

Two inventions which have been of much value to the mariner are Sir William Thomson's improvement on the construction of the compass, and his provision for overcoming the influence of a ship's magnetism on that instrument. The former was effected by making two changes. The compass card was lightened, and for the few coarse needles which were attached to it he substituted a large number of small ones. The other object was attained by placing on opposite sides of the compass, and near it, small globes of iron whose size and distance were subjects of careful computation.

For measuring charges of "static" electricity, apparatus of different types has been used. Sir William originated one of the most serviceable, the quadrant electrometer, and made useful additions to some of the others. In fact, it is prob-

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ably true that he did more than any other electrician, living or dead, to introduce accurate methods of measuring electricity. A machine for predicting the level of the tides in any part of the world is probably the most important of his non-electrical inventions.

The wide experience, deep insight and sound judgment of this man in time made him such an authority in electrical science that his opinion was eagerly sought regarding many industrial enterprises in which those qualifications would be of value. When a number of American capitalists first seriously proposed to "harness Niagara" a board of experts was convened to study the possibilities of the plan; and the Glasgow professor of natural philosophy (who was elevated to the peerage in 1892) was its chairman. The first visit which he made to this country after the project had begun to materialize was in 1897, and he made a trip to the Falls for the express purpose of seeing what had there been accomplished. He regarded the achievement with profound enthusiasm.

In the work of other electrical inventors Lord Kelvin ever evinced the liveliest and most unselfish interest. At the dinner in his honor given by the American Institute of Electrical Engineers and Columbia University in 1902 he publicly and cordially praised Mr. Edison, who sat beside him, for perfecting the incandescent lamp. A few months later George Westinghouse held a reception in London, largely for the purpose of exhibiting an invention of Cooper Hewitt, the so-called "current rectifier." Lord Kelvin evinced much delight with the apparatus. It was on that occasion, by the way, that he commended the introduction to England of certain American business methods, of which he regarded his host a fine exponent. As might have been expected, he showed a much more sympathetic emotion than curiosity when Marconi began to attract attention in England. The first commercial messages transmitted in England were despatched (in 1898) from Glum Bay, Isle of Wight, by Lord Kelvin. One went to Sir George Stokes, in Cambridge, a second to his assistant, in Glasgow, and a third to Lord Rayleigh and Sir William Preece, in London. Shortly after the opening of the twentieth century much was heard about the composite nature of the atom. The latter, instead of being indivisible, is believed by a number of experts to be a collection of tiny, negatively electrified particles so small that a thousand would be needed to equal the bulk of a hydrogen atom. Professor J. J. Thomson, of Cambridge (who is no kinsman of the Glasgow scholar), has been a conspicuous advocate of this theory. One of the first men whose opinion was worth considering who admitted its credibility was Lord Kelvin, though he was careful not to commit himself fully on the subject. The expression was the more notable because he had once fancied that an atom might have a construction and an internal motion like those of a ring of smoke ejected from a locomotive smokestack.

In the recent investigations in regard to radium and radio-activity, Lord Kelvin took a deep and lively interest, while maintaining a consistently conservative stand. When Professor Soddy reported, and Sir William Ramsay by later experiments confirmed, the apparent transformation of a gaseous emanation of helium into radium, Lord Kelvin would not assent to the theory, based upon those experiments, that one element could be evolved from another. He also refused to accept the theory, lately advanced, that the heat of the sun or the earth is due to radium, asserting that nothing so far brought forward was sufficient to controvert the older theory that the heat of those bodies was due to gravitation.

A department of work which appeals less strongly to the popular mind than to trained scientists is Professor Thomson's development of the relation which exists between heat and mechanical power. The period that lay between 1840 and 1850 may be said to have marked the dawn of definite ideas on this subject, but it also witnessed a lively conflict between the views of Joule and Carnot. Thomson's own study of the matter enabled him to reconcile these doctrines, and he co-operated with Joule in experiments which aided in dispelling the uncertainty. These related to thermal effects in fluids, and their results were communicated to the Royal Society in 1862. In one of his early papers Professor Thomson gave an instructive table of the efficiencies of the best steam engines and boilers of that day, comparing the actual duty performed with that which theory required. As early as 1848 he published an article on an absolute thermometric scale, and in 1854 he modified his proposition. Two long articles from his pen in the "Encyclopedia Britannica" have been republished under the title, "On Heat and Electricity." In 1867 the first volume of "A Treatise on Natural Philosophy," the joint work of himself and Professor Tait, appeared, and a second edition was issued in 1879. This work, in which the effort was made to base a complete theoretical analysis upon the doctrine of the conservation of energy, was never carried beyond the division of mechanics, but it contains much material of the highest value.

Lord Kelvin's other published writings are comprised in "Electrostatics and Magnetism" (one volume), "Mathematical and Physical Papers" (three volumes), "Popular Lectures and Addresses" (three volumes), and "Baltimore Lectures" (delivered at Johns Hopkins University, in 1884).

Next after his inheritance of intellect and a passion for the investigations of natural phenomena, perhaps Lord Kelvin's most helpful quality was his fine mastery of mathematics. This not only gave him a precious instrument of research, but it also promoted close reasoning.

Two of several visits to America were made by

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Lord Kelvin in order to attend meetings of the British Association for the Advancement of Science. Ordinarily, those gatherings are held on the other side of the Atlantic, but every now and then Canada is honored. The meeting of 1884 was in Montreal, and that of 1897 in Toronto. Unlike some American scientists, he was unfailing in his attendance on the annual assemblies of such organizations long after it ceased to be in their power to confer any distinction upon him. His loyalty was betrayed not only at home, but even when it involved the trouble and expense of an ocean voyage.

To enumerate the honors and decorations bestowed on this great man would be almost impossible. He has had almost countless degrees from the leading universities in Great Britain and America. He has been elected president of many scientific bodies, among them the Royal Society of Edinburg, the British Association for the Advancement of Science, the Institution of Electrical Engineers and the Royal Society of London. The office last mentioned has, since Newton's day, been regarded as the highest to which a British scientist could aspire. He was a foreign associate of the Academy of Sciences, in Paris, and an honorary member of other similar organizations. He was a grand officer of the Legion of Honor, in France; a knight of the Grand Cross of the Royal Victorian Order, a Knight of the Ordre pour le Mérite, of Germany, and a commander of the Order of Leopold of Belgium. He was also a member of the Order of the First Class of the Sacred Treasure, of Japan, and of the Order of Merit established by Edward VII in 1902. That he was made a peer by Queen Victoria at the opening of the year 1892 was a source of delight to his scientific friends, who felt not only that the compliment was deserved, but also that it was a public recognition of the value of science. At the same time, it involved the abandonment of a name which has still adhered to many of the recipient's inventions. The new one was derived from a stream, the Kelvin, which empties into the Clyde at Glasgow, and beside which the present university buildings in that city stand.

The Marconi Company's Reply to Prof. Fessenden.

An article in the Scientific American in November last, written by Prof. R. A. Fessenden in criticism of the Marconi company, and which was republished in Telegraph Age, has elicited a reply from Mr. J. Bottomley, vice-president of the Marconi Wireless Telegraph Company of America, addressed to the Scientific American, which we give herewith:

"With reference to an article which appeared in your esteemed issue of November 16 last, over the signature of Prof. R. A. Fessenden, I am directed by Commendatore G. Marconi to inform you, for publication in your journal, that beyond denying generally the statements of Prof. Fessenden and dissenting from assertions made and conclusions arrived at in said article, he regrets that exigencies of business prevent him from entering into controversy on the subject, but that he simply invites reference to actual statements made by him before British and Italian scientific societies, for which statements he holds himself fully and solely responsible.

"Com. Marconi desires me further to state that he intends to reserve detailed information respecting transatlantic wireless telegraphy for inclusion in papers which he has promised to read during this coming winter before American and British scientific societies."

Recent Improvement in Fire Alarm Apparatus.

Inking registers for fire alarm service have generally been considered as objectionable, as the ink must be frequently renewed, and the printing is liable to vary in legibility. For these reasons the inking register has been quite generally superseded, except for "multiple pen" registers, by punching registers. The punching register, although a marked improvement over printing registers, has had slight imperfections of its own.

The Gamewell Fire Alarm Telegraph Company has recently brought out a new punching register which is apparently perfect in every detail and will doubtless supersede its predecessors. The new register cuts two sides of a triangle and depresses the edges of the paper. The apex of the triangle shows the direction in which the paper is traveling and thus adds to the value of a detached tape as a record. There are no "blanks" falling away from the paper to be disposed of as in the present type of round hole registers.

The most important feature of the new register is that it is available for the large multiple pen registers, which receive records from several circuits on wide paper.

The production of this new register is in line with the general policy of the Gamewell Company to bring all details in fire alarm telegraphy as near as possible to perfection, and to introduce all improvements in devices as soon as their value has been fully demonstrated.

Col. Plum a Life Member of Telegraph Age Clientele.

Colonel William R. Plum, of Lombard, Ill., a retired lawyer and the historian of the Society of the United States Military Telegraph Corps, writes in this kindly and appreciative vein when recently renewing his subscription to Telegraph Age:

"It is now forty years since I quit the telegraph, which more than paid my expenses through college, but were it a hundred, I know I would still want to keep in touch with the fraternity, which I do largely through your valued paper. Please consider me a life member of your clientele."

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PERSONNEL OF THE TELEGRAPH

THE CONSIDERATION OF THE PERSONNEL OF THE TELEGRAPH IS ALWAYS A SUBJECT OF INTEREST. WHEN REVEALED THROUGH BIOGRAPHICAL SKETCH, GIVING, BRIEFLY THOUGH IT MAY BE, A RECORD OF THE LIVES OF MANY WHO ARE STILL WITHIN THE RANKS, OR OF THOSE WHO HAVE STEPPED THEREFROM AND HAVE WON SUCCESS IN OTHER AVOCATIONS, THE RESULT IS TO SHOW IN PLEASANT LIGHT AND IN CLOSE JUXTAPOSITION THE INTENSE PERSONALITY OF THE WORKING FORCE OF THE TELEGRAPH, LOVE FOR THE SERVICE AND LOYALTY TO EMPLOYING INTERESTS; FURNISHING A REVELATION, INDEED, OF WHAT MAY BE TERMED THE "HEART BEAT" OF THE BUSINESS. IN MANY OF THE SKETCHES THAT FOLLOW A WHOLESOME LESSON MAY BE LEARNED OF THE DIGNITY AND POWER OF INDIVIDUAL CHARACTER THAT HAS ENABLED OPERATORS POSSESSING OPPORTUNITIES NO GREATER THAN THOSE HELD IN COMMON WITH THEIR FELLOWS, TO RISE ABOVE THEIR SURROUNDINGS, AND WHO HAVE FOUND SUCCESS IN PROMOTION THAT HAS CARRIED THEM TO THE HIGHER POSITIONS WITHIN THE GIFT OF THE TELEGRAPH, OR IN GAINING PREFERMENT IN BUSINESS ALLIED OR FOREIGN THERETO.

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COL. ROBERT C. CLOWRY.

President and General Manager of the Western Union Telegraph Company, New York.

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Robert C. Clowry, President of the Western Union Telegraph Company.

The Western Union Telegraph Company has always been well officered. The executive heads have been men of strong character, who have brought to that office personalities that stand out in distinct and rugged perspective as viewed in retrospect at this point of time and place in the company's history. Under these men, who in the past have administered its affairs and aided in shaping the destinies of this great company, the present chief executive, its president and general manager, Col. Robert C. Clowry, has faithfully served a long stewardship, working diligently with intelligent motive and conception of duty, until at length he, too, in the evolution of position, was bid to the high office he now holds.

It is a pleasure for Telegraph Age on an occasion so opportune as that of its twenty-fifth anniversary, to refer in this public manner to the worth and ability of Colonel Clowry, to write words that express the sentiment of truth and that are directed by a sense of high personal regard and profound respect, a tribute to the fine character of the man, to the purity of his life and to the great work he has accomplished. For the best purposes in life are frequently not realized when merited words of acknowledgment for duty well done, for the appreciation of conscientious effort, for generous comradeship and for all those refined and kindly sensibilities in human character that by contact confer happiness and repose in others, are left unsaid until death shall have silenced the actor whom we loved and were really glad to honor, but of whom we carelessly or selfishly neglected to speak. As William Winter expressively writes in his beautiful tribute to Stoddart, who recently died: "The memoirs that the world needs for its guidance and help, are those of the men and women who are genuine, who have borne the burden and heat of the day, who have helped to strengthen and beautify the passing life of their generation."

In the ceaseless activities of a long life Colonel Clowry has been true to his ideals, faithful to obligations to employing interests, those due to his fellow men, and to the intimate ties of domestic relationship. He has achieved success because it has been earned. Never a laggard, always alert, he has given an equivalent all his life for what he has received. Honest blood is in his veins, and the country home out in Illinois, which he left at an early age to begin the battle of life, was typical in its sturdy Americanism, in the simple life that was lived there and in the resulting integrity of purpose that inspired and controlled individual membership of the family. Such a heritage is of priceless value. It is manifest in the lives of many eminent Americans, boys from the farm who have reached exalted position, for its subtle influence is felt in unending measure, holding errant nature in check, yet directing to security of pathway. To such a birthright, about which cluster tender, abiding and refining memories, does Colonel Clowry owe his origin. Its physical and moral influences are moulded in his person and character. He grew up to youth and manhood governed by principles of rectitude because he knew no other way; that was his training, his ancestry asserting itself.

The telegraph early engaged Colonel Clowry's attention, and from the humble position of a messenger boy he has passed upward to the top, through all grades of the service, including exciting army experiences in the military telegraph during the Civil War, in which he displayed intimate practical knowledge of his subject, such as to establish his authority and large talent for leadership. Here in fact, he gained his military title, which was awarded by the government for "meritorious services and devoted application to duty."

The details of Colonel Clowry's career have frequently been adverted to in these columns. A cursory summing up at this time will suffice. Mustered out of the army May 31, 1866, he received an immediate appointment as superintendent of the Western Union Telegraph Company, with headquarters at St. Louis, his district covering the territory with which he was especially familiar by reason of his army record. In December, 1878, he became assistant general superintendent at Chicago under Gen. Anson Stager, succeeding to the office of that incumbent in May, 1880. In October, 1885, Colonel Clowry was elected a vice-president, director and a member of the executive committee of the Western Union Telegraph Company, while still retaining the general superintendency at Chicago. He was elected president and general manager of the company in 1902, and removed to New York to assume the duties of that great office.

In this position, with unlimited range permitted for the exercise of his managerial abilities, and assisted by the able staff he has gathered about him, Colonel Clowry has come into the full and realizing possession of his latent strength and power. He is a great executive, directing the vastly extended and complex telegraph system, far exceeding all others in the world in magnitude and in the volume of business handled, of which it may be said he is a constituent part, woven into its very warp and woof through years of active association. His information respecting the telegraph is practical, profound and many sided. This enables him to quickly reach conclusions regarding the multitudinous questions that constantly come up for adjudication. In this he is aided by the action of a judicial mind. He is philosophic in his reasoning, systematic in his methods, and although a hard worker never allows himself to overwork and thus impair his health, his brain and his judgment. He is a keen observer, an excellent judge of men, a quiet yet firm and just disciplinarian, his findings oftentimes being directed and tempered by the influence of a kindly heart. When he deems himself to be in the right and principle is involved, he is tenacious of the position for which he may declare.

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GEN. THOMAS T. ECKERT.

Chairman of the Board of Directors of the Western Union Telegraph Company, New York.

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General Thomas Thompson Eckert.

General Thomas T. Eckert was born in St. Clairsville, Belmont County, O., April 23, 1822, and having been engaged in the telegraph business for over sixty years, he is now, at the age of eighty-six, in his position as chairman of the board of the Western Union Telegraph Company, the largest telegraph organization in the world, easily the dominating character in any history of the "Telegraph in America."

There is so much to stimulate and encourage youthful ambition in his early career, in his infatuation for the telegraph and in the way in which he overcame obstacles in his path when once he determined to learn the new and wonderful art, that we deem it worth while to lay before the readers of Telegraph Age in particular, and the telegraph world in general (we believe for the first time), an account which must necessarily be brief, of how Thomas Thompson Eckert became a telegraph operator.

In the early forties, when Morse was supplicating Congress for the small appropriation of $30,000 with which to build an experimental line, the official Congressional proceedings in the pages of the National Intelligencer, a weekly publication, were eagerly scanned by old and young to a far greater extent than is now the case when the daily news, gossip and oftentimes the scandal of the whole world are laid before us at the breakfast table, while the proceedings in Congress are read by comparatively few. Young Eckert read the printed accounts of the new and wonderful art and became possessed with its spirit and talked about the electric telegraph almost incessantly, so that he was chided by his parents, who told him the neighbors would soon think him daft. To those who in later years have had business dealings with General Eckert it will not seem strange that the more opposition he encountered when he became Morse's disciple the stronger was his resolve to journey to Wheeling, where it was announced in the spring of 1847 that a telegraph office was about to be opened. Closing his ears to the appeals of his good old father and mother, young Eckert mounted the stage at Wooster, his home, with his entire savings, $30, arriving at Wheeling only to learn that it was uncertain when the line would be finished and that Cumberland was the nearest eastern telegraph connection. He thereupon engaged himself as a stage driver over the national pike, his pay being free return passage, but alas! he learned at Cumberland that although the poles were erected the wires were not strung and he must go on to Baltimore if his dream was to be realized. On the stage journey to Cumberland a passenger—a Louisville merchant traveling to New York to buy his season's goods—had been attracted by Eckert's skillful handling of the horses and by his story, gleaned from him in fragments, of the purpose of his journey from Wooster. This new found friend offered to pay Eckert's railroad fare to Baltimore, which offer was gladly accepted. At Baltimore the Louisville merchant went with Eckert to the telegraph office, where they were informed by the manager, a man named Rogers, that Prof. Morse's instructions were positive not to give information to outsiders nor allow anyone to come inside the office. Returning to the Fountain Hotel, Eckert was at first in despair, but soon resolved to continue his journey to New York, which he did, by rail, stage, steamboat and horseback, working his way a large part of the distance, in one case leading some horses to the State Fair at Trenton, and from there to Newark, driving a pedler's stage in place of the regular driver, who had indulged too freely in liquor at the Fair. Arriving at New York by packet from Newark, and still with his $30 in his pocket, Eckert went first to the old Astor House, which at that time was said to be the largest hotel under one roof in the world. The clerk told him the house was full and he could not have a room. Just then the elder Stetson came out of the private office and finding that Eckert was from Ohio plied him with questions about business in the West, which Eckert was only too glad to answer. His manner impressed Stetson so favorably that he gave him a note to the proprietor of a new hotel in Murray street. Arriving there, Eckert found the man was from Wooster, O., and that among his boarders were Henry Jenkins, son of a banker from Columbus, recently come to New York. Young Jenkins had been Eckert's boyhood chum and when he appeared he was overjoyed to see his early friend and insisted upon his going with him to his father's new house far uptown, on 14th street. Eckert's baggage consisted of a homely-looking carpetbag made by himself, he having learned the saddler's trade in Wooster. The next morning, with a letter from Jenkins, Eckert went to the Astor House, where a telegraph office was about to be opened, and there for the first time he feasted his eyes upon the crude relay, key and register, which together must have weighed at least forty pounds. The operator, Augustus Swan, had no such orders from Prof. Morse as in the case of the Baltimore man and at Stetson's request freely gave Eckert full information in regard to the new invention, sending over the wire and embossing upon the narrow strip of paper by means of the register pen, the Morse alphabet, Eckert's name in full, the name of the place he came from and the date, together with a lot of additional matter. Eckert remained several days in New York, devoting nearly all his waking hours to the study of the telegraph, and before he started homeward he had mastered the rudiments and learned most of the alphabet.

Upon Eckert's return to Wooster he was a proud man and, in fact, became the hero of the town, and long before J. H. Wade had extended the telegraph line from Cleveland via Wooster to Cincinnati, Eckert was ready to begin the practical study over an actual wire. The manager at Wooster in 1849, when Eckert was appointed by President Taylor postmaster at Wooster, was S.

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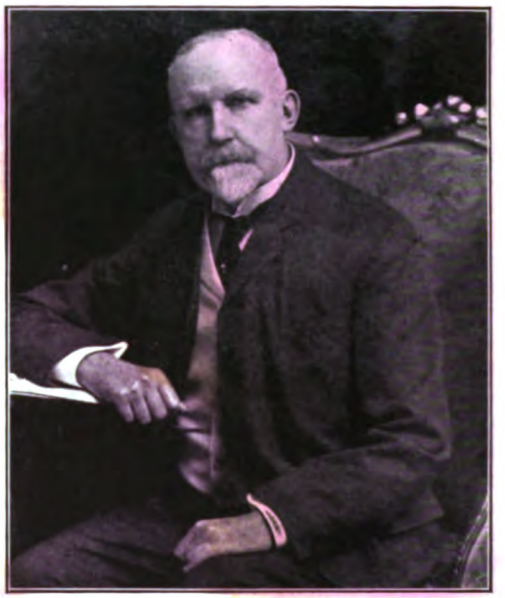
H. Kaufmann, who died a few years ago in Washington, D. C., and when Kaufmann was transferred to Zanesville, Eckert was appointed at Wooster in his place. In 1851 Eckert took a contract jointly with J. H. Wade to build a telegraph line on the Fort Wayne Railroad from Pittsburg to Chicago. He was appointed superintendent of telegraph on that road shortly after the line was completed, which position he held until succeeded by O. H. Booth. About 1859, the Fort Wayne Railroad having gone into bankruptcy and Eckert having received as his share of the contract price $150,000 worth of railroad stock which became worthless, he left the telegraph business temporarily and went to North Carolina to superintend a gold mine controlled by wealthy men in Baltimore, after one of whom, named Steele, the mine was named. When the war broke out Eckert was suspected by his neighbors of disloyalty to the South, was arrested, released, at the risk of his life, came North with his family, and was called by Thomas A. Scott to enter the government telegraph service at Washington, first as manager of the office at McClellan's headquarters, and in the early spring of 1862 as chief of the War Department telegraph staff, and superintendent of telegraph lines in the Army of the Potomac. These positions he held until after the close of the war, receiving a commission first as captain, then as major, next lieutenant-colonel, and on March 13, 1865, was made brigadier-general for "meritorious and distinguished service." He was also appointed assistant secretary of war. He resigned from the government service August 1, 1866, to become general superintendent of the Eastern division of the Western Union Telegraph Company. In 1875 he became president of the Atlantic and Pacific Telegraph Company, and five years later president of the American Union Telegraph Company, both of which systems were consolidated with the Western Union Telegraph Company in 1881, when he went back to that company as vice-president and general manager. Upon the death of Dr. Norvin Green in 1892, he became president of the Western Union company, and in 1902 retired from active management and was made chairman of the board of directors, which exalted position he still occupies.

As indicated at the beginning of this rather desultory account, it is intended chiefly to cover General Eckert's early telegraph career.

J. B. Van Every, Vice-President Western Union Telegraph Company.

John B. Van Every, vice-president of the Western Union Telegraph Company, a position which carries with it the important duties of auditor, is an executive officer who ranks among those who have been longest in the service. He was born at Rochester, N. Y., July 30, 1839, and entered the employ of the company on June 1, 1864, as assistant to Edward Chapman, at that time auditor of the company. This was at Rochester, and before the company had removed its headquarters to New York. W. H. Abel succeeded Mr. Chapman, but when he resigned in October, 1872, on account of ill health, Mr. Van Every was appointed auditor, a position he has since continued



JOHN B. VAN EVERY.
Vice-President Western Union Telegraph Company, New York.

to hold, together with that of vice-president, to which he was subsequently elected. He has administered the affairs of his office with much ability, and has a profound and intimate knowledge of its details, which, coupled with his memory of facts, figures and dates, renders him a veritable encyclopedia of its intricacies of record.

Mr. Atkins, Vice-President Western Union Telegraph Company.

George W. E. Atkins, for many years superintendent of the contract and free service depart-

G. W. E. ATKINS.
Vice-President Western Union Telegraph Company, New York.

ments of the Western Union Telegraph Company, New York, who was first elected to the position of acting vice-president in charge of the

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contract department, is now a full vice-president and a member of the board of directors of the company. This elevation conferred upon Mr. Atkins an added dignity, and widens the scope of his influence and operations, and was accepted as a just recognition of the ability and faithfulness with which he had conducted the affairs of his important office.

Mr. Atkins' career affords another instance of the value of application, study and conscientious effort on the part of the individual as requisites in determining and rendering possible success in life. Mr. Atkins, who is a native of Tennessee, where he was born in 1850, began life in the railroad telegraph service, advancing from the positions of messenger, office boy and batteryman to that of operator for the Nashville and Northwestern Railroad, his accession to the key being in 1865, at Waverly, Tenn. Railroad telegraphy engaged his attention during his earlier years, and when he first came to New York from the West in 1875, he was not only an accomplished telegraph operator, but was also an expert stenographer. His appointment to the head of the contract department of the Western Union Telegraph Company in 1896, placed him in a position where the versatile aptitude of the man was given opportunity to obtain fuller development. His long experience in his department has broadened him into a man of executive force and character, and with a ready command of papers, knowledge of contracts and accounts, excellent memory and methodical habits of labor, render him one of the most efficient officials of the Western Union executive force.

For many years Mr. Atkins was the treasurer of the Telegraphers' Mutual Benefit Association, and at present is the president of the Gold and Stock Life Insurance Association, and a vice-president and member of the board of directors of the Gold and Stock Telegraph Company.

Thomas F. Clark, Vice-President Western Union Telegraph Company.

Thomas F. Clark, vice-president of the Western Union Telegraph Company, was born at Norfolk, England, July 9, 1845. His early education was acquired at Bury St. Edmunds, Suffolk. It was his original intention to engage in commercial business, in which for a time he was employed, but he afterward entered the service of the Electric and International Telegraph Company, London, and on the assumption of the British telegraphs by the government, he entered the Postal telegraph service. In May, 1871, he came to America, and soon after his arrival met General Thomas T. Eckert, at that time general superintendent of the eastern division of the Western Union Tlegraph Company, by whom he was employed as private secretary. When General Eckert became president of the American Union Telegraph Company, Mr. Clark was elected secretary of that organization. On the consolidation of the two telegraph companies named, in January, 1881, he returned with General Eckert to the service of the Western Union company. In 1882, he was elected secretary of the American Telegraph and Cable Company, and in 1887 of the International Ocean Telegraph Company. Subsequently he was appointed assistant to the president, his marked abilities later being more definitely recognized by his promotion to be a vice-president of the company. In this position his services have been of a superior order. Mr. Clark is a scholarly man, possesses literary ability, and

T. F. CLARK.
Vice-President Western Union Telegraph Company, New York.

his writings are well known. He is a director of the New York Telephone Company, the American Union Telegraph Company, the United States Telegraph Company, the Franklin Telegraph Company, the International Ocean Telegraph Company, the American Telegraph and Cable Company, the Gold Stock Telegraph Company, the Stock Quotation Company and sundry other companies.

M. T. Wilbur, Treasurer, Western Union Telegraph Company.

Myron T. Wilbur, treasurer of the Western Union Telegraph Company, is a native of New York State, having been born in Walworth, Wayne County, October 16, 1840. He entered the service of the Western Union Telegraph Company, at the instance of his uncle, the late Judge Palmer, as a clerk, on May 12, 1869. He was later promoted to be cashier of the company, and in 1881 was appointed assistant treasurer, succeeding to the treasurership on the death of R. H. Rochester, which occurred November 27, 1897. Mr. Wilbur is the treasurer of the Gold and Stock Telegraph Company, the Southern and Atlantic, the Pacific and Atlantic, the Franklin telegraph, Delaware River Telegraph Company, and about forty other subsidiary companies to

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the Western Union Telegraph Company; also treasurer of the American District Telegraph

M. T. WILBUR.
Treasurer Western Union Telegraph Company, New York.

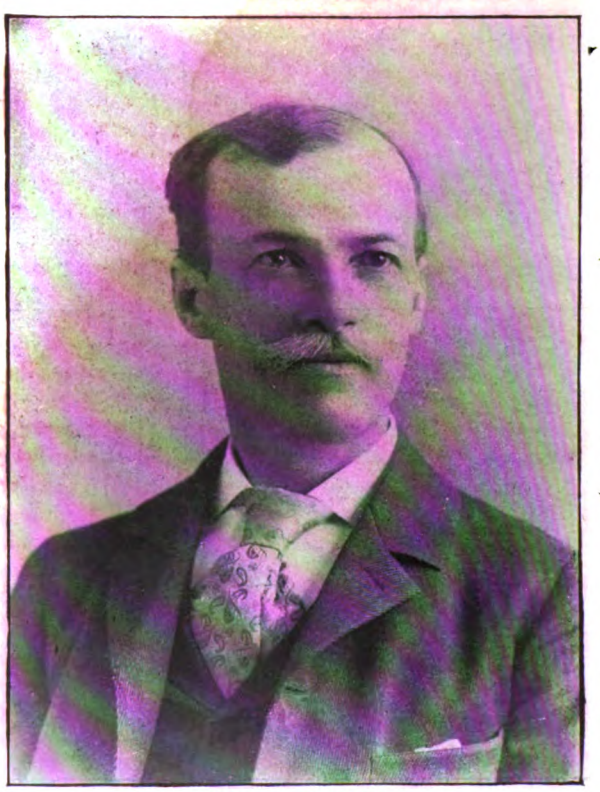
Company of New Jersey, and some forty subsidiary companies.

T. W. Goulding, European General Manager, Western Union Telegraph Company.

T. W. Goulding, European general manager, at London, England, of the Western Union Telegraph Company, is of English birth, having been born near London, April 2, 1863. He came to America at an early age and found employment in the telegraph service as a messenger for the Great North Western Telegraph Company, at Winni-

T. W. GOULDING.
Western Union Telegraph Company, London.

peg, Man., in 1877. Learning to telegraph he became an operator and as such in 1880 obtained a position at St. Paul, Minn. Later, he returned to Winnipeg, rejoining his former company as an operator, and where in quick succession he was advanced to the positions respectively of chief operator, manager and acting superintendent. Resigning, he transferred his services to the Canadian Pacific Telegraph Company, in whose employ he remained for several years, when impaired health induced him to temporarily give up business. He took advantage of the situation to make a visit to England. On his return to America, in 1895, he went to Vancouver, B. C., again in the interests of the Canadian Pacific Telegraph Company. In 1897, he was made manager for a few months of the office at Nelson, B. C., afterward returning to Vancouver. On the advent of the Western Union Telegraph Company to British Columbia, Mr. Goulding received the appointment of manager at Vancouver of the joint interests of the Western Union and of the Great North Western telegraph companies. This position he retained until July 1, 1902, when he was promoted to be superintendent of the Western Union Telegraph Company, with headquarters at Seattle, Wash., a position he continued to hold until the fall of 1904, when he was selected to go to England, there to represent the interests of the company as its general superintendent. About a year ago he received further promotion, to the position of European general manager, an office which materially adds to his responsibilities and widens the sphere of his actions.



ABIJAH R. BREWER.
Secretary, Western Union Telegraph Company, New York.

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JOHN C. BARCLAY.

Assistant General Manager and Electrical Engineer of the Western Union Telegraph Company, New York.

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John C. Barclay, Assistant General Manager, Western Union Telegraph Company.

In John C. Barclay, assistant general manager and electrical engineer, the Western Union Telegraph Company possesses one of the most competent and practical telegraph men in this country. His technical knowledge is extensive, for since he was an operator at the key, in which he became expert, he has been a close student, a tireless and conscientious worker who has not been satisfied until he has thoroughly investigated, carefully thought out and mastered any problem demanding his solution. He is an efficient co-worker with Col. Clowry, president and general manager of the company, and like his chief, came to New York from Chicago when the present administration in 1902 undertook the direction of company affairs.

Mr. Barclay is a native of Pennsylvania, his place of birth being at Greensburg, that state. His first telegraphic experiences, beginning in 1869, were acquired in the railroad service. He eventually became associated with the Western Union Telegraph Company at Chicago. This was in 1882. Here the real worth of the man became apparent and his advancement was rapid. With his advent to this city he was first appointed to the position of electrical engineer. In this field, with its increased responsibilities, Mr. Barclay not only proved his capacity but developed such skill of managerial fitness that the further promotion to the position of assistant general manager of the company was tendered him, a place especially created in order to relieve the president and general manager from an enormous amount of detail work. This post Mr. Barclay has since held jointly with that of electrical engineer, and in successfully performing the dual duties thus imposed has proved himself to be one of the most versatile men in the telegraph service to-day, for his mind acts with much directness of purpose, quickly grasps an idea, while his natural impulsiveness, brushing aside all obstacles to a clear point of view, permits him to decide upon a question and take speedy action. This trait of character enables him to despatch business quickly and to perform an enormous amount of work each day.

Mr. Barclay possesses inventive genius of a high order, and his numerous patented devices have found a ready adoption in the telegraph. His crowning achievement, however, may be said to have been reached in the Barclay Printing Telegraph system, by which the operation of automatic telegraphy has been greatly simplified, and which affords a solution of the problem of a really practical typewriter page-printing device.

The messages are prepared for transmission on a paper tape by means of an automatic perforator which perforates all of the holes necessary for producing the desired combinations forming a character or letter by one stroke of a key lever selected on a universal keyboard. This tape is passed through an automatic transmitter, a modification of the Wheatstone type, and the signals received at the distant end on a polar relay, the points of which control the local apparatus operating the receiver or printer. There are fifty-six characters grouped in two rows on the periphery of the printer type wheel, thus insuring perfect alignment and uniform imprint. The message is printed on the standard receiving blank ready for delivery, the only attention required at the printer is to feed it with blanks and remove the completed messages. The time consumed in changing blanks averages from one to two seconds. At the sending end two handlings are necessary, once by the perforating clerk and again by the transmitting clerk.

The opinions of telegraph engineers differ as to the advantages or disadvantages of prepared tape transmission. In practice it seems quite clear that tape transmission has many advantages and for this reason the Western Union has adopted it, although the Barclay system is also designed for direct keyboard transmission.

It is obvious that in direct transmission the carrying capacity of the circuit is only equivalent to the speed of the transmitting operator, while with tape transmission it is raised to the actual capacity of the wire, which is very much greater.

By preparing messages on tape for transmission, there is no time lost on the wire, due to slow keyboard manipulation, difficulty in deciphering illegible copy, and other interruptions of like character. The correctness of the tape can be verified as it is prepared in quantities sufficient to fully occupy the circuit, and then sent over the line at a speed and with a precision that cannot be approached by the most expert keyboard operator. The Barclay system is on the polar duplex principle and its operation is not dependent in any way upon an increment of current. It is a non-synchronous system and has a wide range in line current values.

As a matter of interest it may be stated that the Barclay system has been worked successfully over a circuit between New York and San Francisco through seven automatic repeaters, and is now regularly operated between the following points: New York and Chicago, New York and Boston, New York and Philadelphia, New York and Buffalo, New York and Pittsburg, New York and Atlanta, Chicago and Kansas City, Chicago and St. Louis, Chicago and Buffalo, Chicago and Pittsburg, Buffalo and Pittsburg, also Pittsburg and Philadelphia. Other circuits are being established as fast as the apparatus can be manufactured.

"Pocket Edition of Diagrams," etc., by Willis H. Jones, electrical editor of TELEGRAPH AGE, embodies more practical information concerning the telegraph than any book or series of books hitherto published. See advertisement.

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BELVIDERE BROOKS.

General Superintendent, Eastern Division, of the Western Union Telegraph Company, New York.

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Belvidere Brooks, General Superintendent, New York, Western Union Telegraph Company.

Belvidere Brooks, general superintendent of the eastern division of the Western Union Telegraph Company, is a prominent figure in the able staff of officials assembled at the New York headquarters. A man of commanding presence, being over six feet tall and large in proportion, he ranks among the best equipped personalities in the telegraph service. Brought up in telegraph employ, an atmosphere in which he has moved all his life, assimilating its very essence, so to speak, his practical knowledge of the telegraph in general, especially as it applies to this country in particular, with which he has a wide acquaintance gained by personal contact through travel, admirably fits him for the responsible position he fills.

Mr. Brooks is painstaking and methodical in all features of his administration. The condition and needs of his division he thoroughly understands; he is in close touch with his subordinate superintendents and others, and in his frequent tours of inspection, visiting all portions of the territory under his control, he is able to exercise a wise and careful supervision over all interests, and at the same time to cultivate pleasant personal relations among those with whom he is associated, so essential to the general welfare, influencing the promotion and maintenance of a high standard of service.

Mr. Brooks is a native of Texas, having been born at Wheelock, that state, July 6, 1859. When but twelve years of age he became a telegraph messenger at Navasota, that state. Young lad that he was, he was early filled with an ambition to get ahead and succeed in life. He worked hard, was attentive, and eventually learned how to telegraph. This was a start. Practice makes perfect, and whenever possible he worked at the key. Finally his early aspiration was gratified when he was appointed an operator. During the years 1877 and 1878 he served in this capacity and in other positions of trust at various places on the Houston and Texas Central Railroad. His preference, however, was for the commercial telegraph service, not that of the railroad, and this prompted him to seek employment with the Western Union Telegraph Company. This he obtained in 1879. At twenty years of age young Brooks was accounted a good operator, and had already begun to display traits of executive ability that afterward rapidly developed as opportunity was afforded for their growth. In the following year of 1880 he was given the management of the Navasota office. Here he did so well that after an incumbency of but a few months, he was tendered a clerkship in the office of the superintendent at Dallas. The influences he then came under and the training received was in line with just what he required. He was capable but needed direction and practice. From Dallas he was selected to become manager of the Western Union office at Waco, subsequently being transferred to like positions, first at El Paso and afterward at Galveston, both being in the nature of promotions. At the conclusion of his term at Galveston Mr. Brooks was in his thirty-second year and was considered one of the most promising of the younger men in the service holding managerial office. On November 1, 1890, came the appointment as manager of the larger and more important office at Denver, Colo. This was a flattering recognition of the abilities of the young man. But he was self-contained, cool and confident, for he had earned the progress he had made thus far, and what knowledge he had acquired was well grounded. His observation, study and reading had been judicious and well considered. His information was comprehensive and practical. He possessed tact and good judgment. At Denver he made an excellent manager. His office was well conducted, he was energetic and progressive, and all matters coming under his jurisdiction received prompt, careful and intelligent attention. When an assistant superintendent was required at this point it was natural that Mr. Brooks' name should be mentioned for the position. Who else could be the logical choice? He had grown up to the place and fitted into it naturally. He knew the conditions governing his surroundings. So it was that on January 1, 1893, he received the promotion that made him assistant superintendent. He was now thirty-four years old. Denver, always an important point telegraphically, as well as commercially, was growing rapidly in population, and the extensive district in the welfare of which he was now especially interested, was filling up, new towns were being settled, new telegraph offices opened and new lines of wire extended. It was a field of much activity and Mr. Brooks found abundant opportunity for the exercise of his abilities. He fulfilled the confidence that had been reposed in him and met the exactions of his office. In this position he continued for nine years, himself developing in capacity and power in common and in keeping with the country around about him.

It was a big jump from Denver to New York, from the position of assistant superintendent, passing by that of superintendent, to the general superintendency of the most important division in the entire telegraph system. Yet Mr. Brooks was equal to the demands placed upon him and when, early in the year 1902, he said good-bye to his Denver friends and started eastward, it was with a spirit marked by courage, self-confidence and determination to succeed, the same vital force that animated the messenger boy thirty-one years previous. The record of the general superintendent's work here in New York is an open book, to be read by all men.

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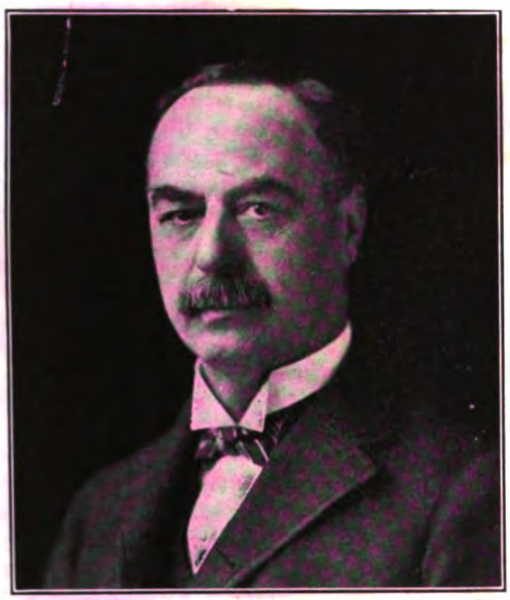
T. P. Cook, General Superintendent, Western Union Telegraph Company, Chicago.

Theodore P. Cook, general superintendent of the western division of the Western Union Telegraph Company at Chicago, Ill., is a native of Tennessee and has grown up and developed with the telegraph business, he having entered the Western Union Telegraph Company's service on the overland route to California when a mere boy. In 1863 he took charge of the office at Lawrence, Kan. He was called next to Atchison, then to Leavenworth, and later to Kansas City. In 1882 he was made night chief operator at St. Louis; afterward becoming manager of the gold and stock department of the local service. In 1885 he was appointed assistant superintendent with headquarters at Dallas, Tex., where he resided until called upon to fill the office of superintendent at St. Louis. From St. Louis he went to Chicago, in March, 1902, to accept the appointment to the office he now holds. Mr. Cook has a thoroughly practical knowledge of every branch of the business. He has always been untiring in his efforts,



THEODORE P. COOK.
General Superintendent Western Union Telegraph Company, Chicago, Ill.

leaving no stone unturned that could in any way enhance the value of the service in whatever department he was engaged.

Rush Taggart, Solicitor, Western Union Telegraph Company.

Rush Taggart, one of the two law solicitors of the Western Union Telegraph Company, New York, holds an honored name in the estimate of the bar of New York. He was born at Smithville, Wayne County, Ohio, September 4, 1849.

Shortly after his graduation from the law department of the University of Michigan, in 1875, he was offered and accepted a position in the service of the Pennsylvania company at Salem, Ohio, as assistant in the office of Solicitor J. T. Brooks. In the fall of 1877, upon the promotion of Solicitor Brooks to the position of general counsel, Mr. Taggart was made solicitor, and for the succeeding ten years had charge of all the legal business on the lines of the Pittsburg, Fort Wayne and Chicago Railway and branches in the state of Ohio.

RUSH TAGGART,
Solicitor Western Union Telegraph Company, New York.

Coming to New York in 1887, he entered the law office of Dillon and Swayne, the senior member of which, Judge John F. Dillon, is now general counsel of the Western Union Telegraph Company, the junior member being General Wager Swayne, himself an Ohioan and a friend of the young attorney. On May 11, 1887, Mr. Taggart became identified with the law department of the telegraph company, a position in which he has since been able to render conspicuous service. Mr. Taggart is well versed in the law, possesses a keen analytical mind, and is a speaker of more than ordinary ability.

Mr. Estabrook, Western Union Solicitor at New York.

Henry Dodge Estabrook, namesake of Henry Dodge, ex-Senator and ex-Governor of Wisconsin, solicitor of the Western Union Telegraph Company, who came to New York shortly after the advent of the present administration, is an Eastern man by birth, yet endowed with a Western growth and training. Puritanical blood flows in his veins, for he is a direct descendant of John Alden, for whom was named, coincidentally, the little hamlet of Alden, in Western New York, where Mr. Estabrook was born, October 23, 1854. When but an infant of six months, he was taken West to Nebraska, then marking the extreme frontier, where the family made their home, the father having become the attorney-general of the then territory of Nebraska. Mr. Estabrook graduated from a law course at the Washington University, St. Louis, in 1876, and entered upon the practice of his profession in Omaha. The only official position he ever held was that of Regent of the Nebraska

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University, to which he was elected by a large majority, running ahead of his ticket. He was the local attorney for the Postal Telegraph-Cable Company, at Omaha, for three years, when he entered the service of the Western Union Telegraph Company in like capacity at the same point. In 1896, on the death of his father, Mr. Estabrook removed to Chicago, where, at the instance of Gen. Eckert, then president, Mr. Clark and Mr. Fearons, vice-president and general attorney, respectively, he was given the local attorneyship of the Western Union. Later he formed the law firm of Lowden, Estabrook and Davis, a partnership that continued successfully until Mr. Estabrook came to New York as solicitor for the Western Union Telegraph Company, September 1, 1902. Mr. Estabrook is an astute lawyer, a man of engaging personality, careful and painstaking in his methods, and is a valuable acquisition to the legal staff of that cor-

HENRY D. ESTABROOK.
Solicitor Western Union Telegraph Company, New York.

poration. His sister, now deceased, was the wife of President R. C. Clowry.

A. G. Saylor, Assistant General Superintendent, Western Union Telegraph Company, at New York.

A. G. Saylor, the assistant general superintendent of the Western Union Telegraph Company, at New York, is a Canadian, a native of Bloomfield, Ont., where he and his twin brother, Superintendent E. B. Saylor, of Pittsburg, were born June 11, 1859. From his earliest years, young Saylor evinced an interest in telegraphic matters, and when but twelve years of age, in 1871, was installed as an operator in the employ of the Dominion Telegraph Company at Ingersoll, Ont. In 1873-74 he served the Montreal Telegraph Company at Ottawa and Montreal, and in 1874 became a night operator for the Grand Trunk Railway at Portland, Me., later entering the employ, first of the Atlantic and Pacific Telegraph Company, and afterward of the Western Union company. Mr. Saylor not only grew expert at the key, but acquired ability as an electrician; for he was always a diligent worker, of an observ-

A. G. SAYLOR.
Assistant General Superintendent, Western Union Telegraph Company, New York.

ing turn of mind and a close student. In 1881 he removed to Philadelphia, finding employment still with the Western Union company. In 1884 he was called from the key to fill the position of wire chief, subsequently becoming in close succession traffic chief and chief operator. As a tribute to the personal worth and executive ability of the man came his appointment, in 1887, as manager of the office. Later he became assistant to Superintendent Gill, a position he continued to hold until 1902, when he was transferred to New York as chief clerk to General Superintendent Brooks. His promotion to be assistant general superintendent dated from January 1, 1907.

Mr. Saylor comes from Quaker stock, and he possesses many of the attributes of character derived from that source. On his paternal side his ancestry is German, while on his mother's it is English, the sturdiness of each of which is well exemplified in the well-poised temperament observed in the object of this sketch.

F. J. Scherrer, Private Secretary to Colonel Clowry.

Franklin J. Scherrer, secretary to Colonel Robert C. Clowry, president of the Western Union Telegraph Company, New York, is a native of Chicago. He entered the telegraph service as a check clerk in the operating department of the Western Union in Chicago, on August 1, 1882. From this position he was promoted to be office boy, first in Superintendent Tubbs' office and afterward in that of Colonel Clowry, who was then vice-president and general superintendent of the western division of the company. Young Scherrer was attentive to his duties, showed an intelligent appreciation of his place, and attracted the attention and interest of the colonel. Later he was given a clerkship in the office, subsequently being appointed secretary to the colonel. When Colonel Clowry left Chicago and came to New York in

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1902, here to assume the presidency and general managership of the company, Mr. Scherrer, who by this time had become firmly established in the colonel's confidence, accompanied him east.

FRANK J. SCHERRER.
Private Secretary to Colonel Clowry, Western Union Telegraph Company, New York.

Mr. Scherrer is a good judge of human nature, is quiet and unobtrusive in manner, possesses tact, common sense and excellent judgment, attributes of character which, coupled with the fact that he has gained a wide acquaintance among men, enables him to discharge the duties of his position, frequently calling for the exercise of a nicety of discrimination, with an address that has won for him very general commendation.

H. E. Roberts, Superintendent of Supplies, Western Union Telegraph Company.

Horace E. Roberts, superintendent of supplies and general purchasing agent of the Western Union Telegraph Company, New York, was born

HORACE E. ROBERTS.
Superintendent of Supplies and General Purchasing Agent, Western Union Telegraph Company, New York.

at Battle Creek, Mich., November 15, 1863, and began his telegraphic career November 11, 1879, at Chicago as a messenger boy. February 7 of the following year young Roberts entered the office of the general superintendent of the Western Union Telegraph Company, Chicago, since which time, in varying capacities, he has been in the service of the present president of the company.

J. Levin, Western Union General Superintendent at Atlanta, Ga.

J. Levin, general superintendent of the Southern division of the Western Union Telegraph Company, at Atlanta, Ga., is one of the ablest executives of the Western Union Telegraph Company. He is a Southerner by birth, hailing from South Carolina, although his training was gained in the West, for he went to Atchison, Kan., in 1872, when but twenty-one years of age, and three years after he had entered the telegraph service. Atchison remained his home for sixteen years, the first seven of which he was occupied

JACOB LEVIN.
General Superintendent Western Union Telegraph Company, Atlanta, Ga.

as a press operator in the Western Union office, and the succeeding nine years he filled the position of manager. His acceptable work at this point caused his transfer in like capacity to a number of other points South and West, including the important offices of St. Joseph, Mo., and Omaha, Neb. His promotion to be assistant superintendent took him to Minneapolis in July, 1890. At this point he rapidly developed under the training received and showed his capacity for work and ability as an executive. Early in 1903 he was called to New York to accept the appointment of inspector, an office he held barely six months, when his promotion to the position he now holds followed. During the four and a half years Mr. Levin has been at Atlanta there are many evidences that testify to his painstaking and practical methods.

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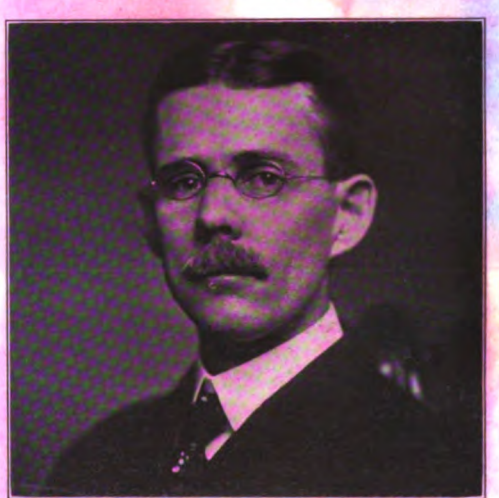
I. N. Miller, Jr., at San Francisco.

Isaac Newton Miller, Jr., the assistant general superintendent of the Western Union Telegraph Company at San Francisco, Cal., an office of but comparative late creation, and of which Mr. Miller is the first occupant, is a man not yet forty years of age, who is making a distinct impression in the telegraph service for all-around ability. He has a naturally bright mind, which has been fed and stimulated by reading and study and practice and by the application of excellent judgment.

Mr. Miller is an Ohioan, New Vienna being his native place, where he was born November 29, 1868. His entry into telegraph employ dates from 1885, when he became an operator in the railroad service in his home town. After nearly two years thus spent he transferred his services as an operator temporarily to the Western Union Telegraph Company at Cincinnati, shortly after accepting the position as secretary to the superintendent of transportation of the Southern Railway at Knoxville, Tenn., remaining there from December, 1887, to February, 1889, when, going to Denver, Colo., he became an operator for the Denver and Fort Worth Railway. This position he held less than six months, when, attracting the favorable notice of Frank Jaynes, Western Union superintendent at San Francisco, he was appointed secretary to the latter, and for five years, from July, 1889, to January, 1893, he continued in this capacity, when he was made chief clerk, an office he held for almost ten years, to December, 1902. This long period of training



I. N. MILLER, JR.
Assistant General Superintendent, Western Union Telegraph Company, San Francisco, Cal.

bore fruit when he was appointed superintendent of the Pacific division of the American District Telegraph Company, at San Francisco. From this place he received promotion October 1, 1906, to that of superintendent of the Western Union Telegraph Company, his further advancement to be assistant general superintendent of the company as well as that of the American Dictrict Telegraph Company, coming to him April 15, 1907.

John C. Nelson, Superintendent.

John C. Nelson, superintendent of the Western Union Telegraph Company at Omaha, Neb., is a native of Denmark, where he was born December 14, 1875. His entry into telegraph employ was at Omaha on May 3, 1888, when he began his career at the bottom of the ladder, rising through the successive grades of check clerk, office boy, clerk, stenographer, private secretary

J. C. NELSON.
Superintendent Western Union Telegraph Company, Omaha, Neb.

to the superintendent, reaching the position of assistant superintendent May 1, 1902, and that of superintendent January 1, 1907, in both of the two latter instances succeeding the late Charles B. Horton. Mr. Nelson was a protege of the late superintendent, Colonel J. J. Dickey, and the excellent training he received under that gentleman's thorough direction is reflected in the present management of the district—the third of the Western division.

Mr. McCammon, Chief Operator of the Western Union Operating Department, New York.

T. A. McCammon, chief operator of the Western Union Telegraph Company, New York, is at the head of the operating department in the main office, 195 Broadway. Mr. McCammon is one of the brightest men in the telegraph service, and ever since he succeeded A. E. Sink, in February, 1905, he has steadily gained in the esteem of his superior officers and in the respect of those constituting the large body over which he presides.

Mr. McCammon is a Canadian, having been born at Kingston, Ont., December 27, 1859. He began his telegraphic career at his native place in 1875, in the employ of the Dominion Telegraph Company, subsequently going to Toronto and London, Ont. Coming to the United States, and pushing West, he found employment in Colorado as a train despatcher on the old Denver and South Park Railroad. Thence he went to San Francisco, and with varied fortune afterward found his way eastward again to Salt Lake City and to Omaha, at which latter place he became

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night chief operator for the Western Union Telegraph Company. Here he made a fine record, which found recognition by his being transferred in 1892 to Denver, Colo., to fill the position of chief operator. At that busy point he remained ten years, gaining much valuable experience and broadening into a man of many all-around qualities. When E. B. Saylor, chief operator of the Philadelphia office, now superintendent at Pittsburg, resigned, Mr. McCammon was brought East to fill his place. This was in June, 1902. This post he held for nearly a year, until May, 1903, when he was promoted to be chief operator, a position then newly created, in the New York office. His subsequent advancement to the position of managing head of the largest operating room in America, placed in that responsible place a man with excellent administrative abilities

T. A. McCAMMON.
Chief Operator Western Union Telegraph Company, New York.

based on a thorough all-around knowledge of the business of telegraphing.

L. E. Rudd, Western Union Manager at Lexington, Kentucky.

Leon E. Rudd, manager of the Western Union Telegraph Company at Lexington, Ky., was born at Menominee, Wis., December 30, 1879, and was the son of the late W. A. Rudd, one of the most capable of telegraph men. Young Rudd became a Western Union messenger at St. Paul, Minn., when thirteen years of age. From messenger to check boy, and afterward to clerical positions, were perhaps natural transitions. But his ambition was not satisfied until he learned telegraphy. This secured to him an opportunity, and from the position of operator he became assistant wire chief, afterward taking charge of a branch office. In 1901 he was made chief operator of the office in Yellowstone Park, and returning to Wisconsin filled successively the offices of manager at Portage, Oconomowoc and Superior, that state. In April, 1904, when his father was manager of the Western Union office in Boston, the son was called to that city and given charge of the branch office in the financial district, the largest in town. In July, 1906, Mr. Rudd resigned his Boston position to accept the

LEON E. RUDD.
Manager Western Union Telegraph Company, Lexington, Ky.

managership of the office at Vicksburg, Miss., from which he was transferred October 23, of the same year, to the Jackson, Miss., office, his promotion to Lexington, Ky., occurring in December, 1907.

U. W. Boggess, Manager at Clarksburg.

Ulysses Willey Boggess is the manager of the Western Union Telegraph Company at Clarksburg, W. Va., in which state he was also born at Fairmont, October 19, 1855. At eighteen years of age he became identified with the telegraph at Altamont, Md. His subsequent services as an

U. W. BOGGESS.
Manager Western Union Telegraph Company, Clarksburg, W. Va.

operator were divided between the Western Union, Atlantic and Pacific and the Baltimore

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and Ohio telegraph companies, The United Press and The Associated Press, in various of the principal cities, besides numerous railroads. For sixteen years Mr. Boggess was connected at Milwaukee with the Chicago and Milwaukee Telegraph Company, a local company connecting those two cities. He has been manager at Clarksburg, near his birthplace, for the past year. Mr. Boggess is an accomplished operator.

Wm. R. Chapman, Manager at St. Paul.

William R. Chapman, manager of the Western Union Telegraph Company at St. Paul, Minn., is a type of the Canadian telegrapher always a welcome importation into this country. He was born at Brighton, Ont., June 14, 1864, and began his telegraphic career in his native place in the employ of the Dominion Telegraph Company in 1878. From 1880 to 1882 he was in the service of the Canada Mutual Telegraph Company at Toronto, subsequently serving the Mutual Union and American Rapid telegraph companies at Buf-

W. R. CHAPMAN.
Manager Western Union Telegraph Company, St. Paul, Minn.

falo, N. Y., and later the Western Union at Chicago and afterward at Jacksonville, Fla. He early developed ability as an operator and showed evidences of executive capacity. This led to his appointment as manager of the Western Union at La Crosse, Wis., a position he held from 1885 to 1904, when he was promoted to the St. Paul office, where he now is.

Mr. Kehrer, Western Union Chief Operator at Minneapolis.

Joseph Kehrer is chief operator of the Western Union Telegraph Company at Minneapolis, Minn., whose brief yet excellent record has thus far stamped him as a young man of commendable parts. He was born at Lakeville, Minn., October 11, 1879, and entered telegraph employ in his native place May 1, 1896. Learning telegraphy, he became an operator, working acceptably and with a studious and observing mind. In the fall of 1901 he entered the Western Union service at Minneapolis. From the position of operator he was promoted to that of wire chief in July, 1903, at the same time becoming acting chief operator. So well did he fulfill his dual

JOSEPH KEHRER.
Chief Operator, Western Union Telegraph Company, Minneapolis, Minn.

duties that on September 1, 1904, he was advanced to the full position of chief operator, where he has since remained.

H. O. Bannister, Western Union Manager at Raleigh, N. C.

Harry Oscar Bannister, manager of the Western Union Telegraph Company at Raleigh, N. C., is one of the youngest men in the service to reach so responsible a position as the one he occupies. For the city of Raleigh, the capital of the state, is an active business center, with a population now approaching 25,000, and to meet the requirements demanded by the situation the telegraph office gives employment to a force, beside the manager, of four operators, two clerks, one book-

HARRY O. BANNISTER.
Manager Western Union Telegraph Company, Raleigh, N. C.

keeper, two linemen and about twelve messengers. Mr. Bannister was born in Virginia, at Richmond, August 11, 1884. His first employ-

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ment in the telegraph service was as a messenger for the Postal Telegraph-Cable Company, in his native city, at the age of fifteen years. Two years later he was advanced to a clerkship, which he held for another two years. Having learned telegraphy, and early exhibiting evidences of executive capacity, manifest in good judgment, ability to organize, etc., he was promoted in July, 1903, to the managership of the office at High Point. Subsequently he was transferred to Suffolk. From July, 1905, to November of that year, he was the relief agent of the Southern Railway, when he became the despatcher of the Georgetown and Western Railroad at Georgetown, S. C. From May, 1906, to January, 1907, he served as an operator in the main office of the Western Union Telegraph Company at Richmond, Va., his appointment to his present position coming to him at the latter date.

Max Handler, Gold and Stock Agent at Cleveland.

Max Handler, agent of the Gold and Stock department of the Western Union Telegraph Com-

MAX HANDLER.
Agent Gold and Stock Telegraph Company, Cleveland, Ohio.

pany at Cleveland, Ohio, although a native of Philadelphia, Pa., where he was born June 26, 1865, has gained his entire telegraph experience in Cleveland. For it was in this city that he entered the service of the telegraph, September 1, 1881. From the position of messenger he became a check boy, thence entering the bookkeeping department. Acquiring the art of telegraphy he became an operator, first in the Dock office, afterward in the main office, subsequently being transferred to the commercial news department. In his present position he succeeds the late Louis A. Somers, of pleasant memory, and like the latter, proving himself to be an efficient head of the department he is serving.

J. E. Palmer, Chief Operator at Reno.

J. Edwin Palmer, chief operator of the Western Union Telegraph Company at Reno, Nev., an important relaying point, one of the older members of the great army of telegraph workers in this country, has long enjoyed a reputation as a first-class telegrapher, and as a man of ster-

J. E. PALMER.
Chief Operator, Western Union Telegraph Company, Reno, Nev.

ling integrity of character. Vermont has been generous in furnishing telegraphic personality. From this state Mr. Palmer hails, his birth having occurred at Kirby, January 22, 1842. He learned telegraphy at Pittsburg, Pa., his career in the service dating from September, 1865. He has held subsequently various responsible positions, including that of wire chief, repeater chief, night manager, and manager of the office at Flagstaff, Ariz. In whatever position employed he has contributed the best of service, governed always by conscientious motives.

A. M. Lewis, Traffic Chief at "195."

Arthur M. Lewis is the Eastern traffic chief in the main office of the Western Union Tele-

ARTHUR M. LEWIS.
Eastern Traffic Chief, Western Union Telegraph Company, New York.

graph Company, New York, where he also acts as agent for Telegraph Age. Mr. Lewis is a

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Welshman, having been born near Swansea, Glamorgan County, South Wales, in 1862. His early education was obtained mainly in the grammar school, Bristol, England, and he came to this country in 1878. He has since resided in New York. His first occupation was that of a clerk for the American District Telegraph Company, subsequently becoming manager, respectively, of several uptown offices. Having learned telegraphy he entered the service of the Western Union Telegraph Company in 1883. Industrious and painstaking and having that quality of dependableness, he was placed successively in charge of several of the larger branch offices. In 1890 he was transferred to the general operating department at "195." The same qualities that brought him previous preferment, operated in his favor in this new field of endeavor. Always a student and close observer, attentive to his duties and not afraid of work, Mr. Lewis acquired an excellent practical knowledge of telegraphy, and the reward of promotion came when he was created a traffic chief in 1895.

M. H. Kerner, Telegraph Inventor and Musical Writer.

Marion H. Kerner, an operator of the Western Union Telegraph Company at 195 Broadway, New York, is a well-known old time and military telegrapher. He was born at Baltimore, November 25, 1839, and in 1852 entered the telegraph service of the Baltimore and Ohio Railroad at Oakland, Md. His has been an eventful career. While on duty as an operator at Harper's Ferry he witnessed the execution of John Brown. When the Civil War broke out Mr. Kerner promptly

MARION H. KERNER.
New York.

tendered his services as an operator to the government. He served in this capacity during a portion of the great conflict and met with many exciting experiences. For a while he was confined as a prisoner in Libby Prison. He was compelled to retire from the army telegraph because of sickness. Thereafter for a number of years he was connected with the Adams Express Company in his native city, subsequently becoming interested in electrical ventures in Chicago. He invented a burglar alarm system in 1882 which he sold in Europe. In 1890 he witnessed the Passion Play in Europe, and was the first person to bring authentic views of the play to this country. Mr. Kerner has traveled extensively abroad, his observations and experiences derived on such trips forming topics for lectures. He is a frequent lecturer in the public schools on telegraphy and other electrical subjects. Mr. Kerner possesses excellent musical abilities, and is the author of a number of songs, both words and music, in which the telegraph has governed the inspiration.

Allen Woodle, Western Union Manager at Boston.

Allen Woodle, manager of the Western Union Telegraph Company at Boston, Mass., comes

ALLEN WOODLE.
Manager Western Union Telegraph Company, Boston, Mass.

from the West, his native place being Monroe, Wis., where he was born February 12, 1868. When twenty years old, having acquired the ability to telegraph, he entered the employ of the Chicago, Milwaukee and St. Paul Railway at Brodhead, Wis. Subsequently, in Western Union employ at Kansas City, where he came under the immediate tutelage of G. W. Brownson, then chief operator, and now manager of that office, Mr. Woodle developed into an expert operator. After an itinerary that took him South and to Mexico, he finally came East and served the Western Union as an operator in Boston. This was in 1893. In 1899 he was promoted to be manager of the office at Newport, R. I., three years later being transferred to Portland, Me., in the same capacity. In 1905 he returned to Boston to accept the assistant superintendency of the American District Telegraph Company in that city, from which he was appointed to the

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charge of the Boston office, following the death of William A. Rudd, his appointment as manager dating from September 26, 1906.

F. A. Coleman at the Hotel Manhattan.

Frederick Augustus Coleman, agent and manager for the Western Union Telegraph Company at the Hotel Manhattan, New York, has held representative positions of this character ever

FREDERICK A. COLEMAN.
Manager, Western Union Telegraph Company, Hotel Manhattan, New York.

since he first became connected with the telegraph in 1873. His long experience in this branch of the service, in which he has made extensive acquaintance among prominent people, whose confidence and esteem he enjoys, during which time he has gathered a vast amount of information of peculiar value which is always at the disposal of the traveling public, especially fits him for the work in which he is engaged. He was born at Goshen, N. Y., March 7, 1855. Acquiring a knowledge of telegraphy, he became an operator, and on September 20, thirty-four years ago, was appointed general railroad ticket agent and manager for the Western Union Telegraph Company at the Westchester House on the Bowery. From thence in 1874 he was transferred to a similar position at the Cosmopolitan Hotel, at that time one of the most important offices of the kind in the city. Here he remained for six years, when, on September 18, 1880, he was again transferred, this time to the larger uptown Windsor Hotel, since burned. For sixteen years he filled this important post, going to the Hotel Manhattan on September 15, 1896.

George Crighton, Western Union Superintendent at London.

George Crighton, superintendent at London, England, of the Western Union Telegraph Company, is a type of the best class of English telegrapher, an expert operator, well informed, a student and endowed with executive capacity that is manifest in methods pursued and in results achieved. He is a native of Greenock, Scotland, where he was born March 25, 1858. He entered upon his telegraph career at Liverpool, about the middle of 1875, in connection with the Government owned and Post Office controlled service. In July, 1882, he entered the Western Union service at Liverpool as an operator. Four years later, in September, 1886, he was transferred in the same capacity to London. For twelve years he continued as an operator, but with an observant mind and fidelity to duty, he was acquiring knowledge and experience that was eventually to find recognition in merited advancement, for in April, 1898, he received his appointment as clerk in charge. So satisfactory was the character of the work here performed, that in June, 1902, he was elevated to the position of superintendent as first stated.

J. C. Robinson, Night Chief Operator at "195."

James C. Robinson is one of the oldest and best known of the operating staff of the Western Union Telegraph Company at its main office, 195 Broadway, New York, where he holds the position of night chief operator. He was born at Portsmouth, N. H., January 14, 1849, and entered the telegraph service at the near-by point of Saco, Me., October 7, 1864, as a messenger in the employ of the American Telegraph Company. He quickly learned how to telegraph, and after numerous changes became an operator in the Western Union office at Boston. This was in the spring of 1871. Subsequently he had assignments to Newport, R. I., and to Springfield, Mass. Returning to Boston he was assigned to the main press wire, nights. In September, 1879, he was appointed manager of the cable office at

JAMES C. ROBINSON.
Night Chief Operator, Western Union Telegraph Company, New York.

Duxbury, Mass. Coming to New York in 1882 he was given a position as operator on the night force of the Western Union company. His abilities soon won him promotion and he has since acted in the capacity of chief in the various divisions at "195," discharging his duties in a manner befitting the requirements demanded of a first-class telegrapher.

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Mr. Reid, Western Union Superintendent, Seattle.

Robert T. Reid, superintendent of the Western Union Telegraph Company at Seattle, Wash., is a native of Pennsylvania, his birthplace being at Brookville, the date July 21, 1861. It was in 1875 that he entered the telegraph service at Etna Green, Indiana, as an operator in the railroad service. This character of employment engaged his attention until 1880, when he became an operator, filling also the position of night chief operator of the Western Union Telegraph Company at Minneapolis. This he held until the following year, when he returned to the railroad employ, becoming chief train despatcher of the western division of the Canadian Pacific Railway, resigning after two years to become wire chief for the Northern Pacific Railway. For a while he served as a Western Union operator at Ogden, Utah, during 1883-1884, when he returned to Minneapolis to accept a position with The Associated Press. This he retained until 1886, when he became chief operator of the Western Union office in the Minnesota metropolis. His expertness as a telegrapher and his general all-around abilities came into prominence at this time,

ROBERT T. REID.
Superintendent Western Union Telegraph Company, Seattle, Wash.

which led to his appointment in 1888 as manager of the Western Union Company at Tacoma, Wash. For five years he retained this post, from 1888 to 1903, following which he became assistant superintendent of the American District Telegraph Company and Western Union inspector of the Pacific division. From January 1, 1904, to September 1 of the same year he filled the position of Western Union manager at Seattle, Wash., on which latter date he received promotion to the superintendency of the company.

F. O. Nourse, Assistant Western Union Superintendent at Nashville.

Frederick Oliver Nourse, assistant superintendent of the Western Union Telegraph Company at Nashville, Tenn., where J. R. Terhune is superintendent, is a man whose abilities gained him recognition when he was connected with the main office of the company in New York. He has made steady advancement in the service, the rewards which have come to him clearly being those conferred because of merit. Mr. Nourse is a New Englander, a native of New Hampshire in which state he was born at Littleton, October 3, 1859. It was at Wing Road, in the Granite State, in 1876, that the boy Nourse was first instructed in the mystery of the dots and dashes. In New York he rose to the position of general traffic chief. After a temporary retirement from the telegraph service, he returned to its employ in 1903, and was soon placed in

F. O. NOURSE.
Assistant Superintendent Western Union Telegraph Company, Nashville, Tenn.

charge of the Western Union office at Macon, Ga., from which, about three years later, he was promoted to be general inspector of the southern division, making his headquarters at Atlanta. From this position in July, 1906, he was promoted to the post he now holds. Mr. Nourse has strength of character, possesses a pleasant personality, and has a broad, earnest and enduring grasp of the business in which he is successfully engaged.

"Old Farmer Lawton."

George E. Lawton, assistant manager of the Western Union Telegraph Company, at Denver, Colo., is popularly known as "Old Farmer Lawton," and as his humorous writings are so familiar to our readers, we reproduce his picture herewith together with what a Denver paper printed in relation to him:

"Thirty years with the Western Union in Colorado, the greater part of that time right here in Denver, does not leave much margin to tell about any wonderful achievements. I have a slight recollection during the Civil War, while waiting at the depot for trains that brought the daily papers to the little town of Plymouth, Ill., where I sold them, of picking up a few dots and dashes that

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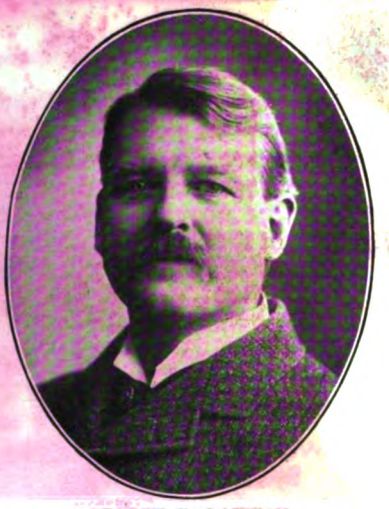
passed through an old-fashioned paper register. The night President Lincoln was assassinated I lost my head for the first, and I hope the last, time in my life. No sooner had Chicago informed Quincy of the greatest calamity that ever befell our Nation than I rushed for the public square, telling everyone I met, but nary a paper did I have to back it up. My opponent in the paper business (now a prominent clergyman), who didn't pry into the secrets of the telegraph, quietly waited for the paper train and, naturally, got all the cream from that night's sale, and practically ran me out of the business.

"After a few years' schooling came my first love affair. A small wire stretched across the street between our houses, carried many dear words from a very sweet girl, and I have always believed that my poor Morse in return had much to do in preventing me from being a married man at fifteen, as the girl's own papa cut the wire when he caught on to what was passing over that circuit.



GEORGE E. LAWTON.
Night Manager Western Union Telegraph Company, Denver, Colo.

"Almost disgusted at ever being able to make anything out of Professor Morse's great invention, my next adventure was at railroading, and my first position was braking on the Burlington out of Galesburg, Ill. But my love for the telegraph cost me this job after a very few trips, as the following note to Superintendent Hitchcock, and which I still retain in my possession, plainly shows:

"'H. H. H.: Please give me another brakeman. This fellow Lawton is physically and morally all right, but he has a bug about hanging around telegraph offices when he should be out on a boxcar. He also has an old telegraph key attached to the top of my caboose that seems to prevent him from gauging the speed of our train. He let us down the Quincy hill on our last trip with fifteen loads of cattle at a speed that caused some of the Texas steers to faint and Engineer Sadler's hair to turn gray.

(Signed) "'SAMUEL RATHBURN,
"'Conductor.'

"The good, but stern, old superintendent bluntly informed me that I was fired. I acknowledged my guilt, but asked him if he could not substitute some other word for 'fired.' This evidently amused him, as he immediately gave me a position as helper for one of the outside agents. With many thanks I accepted his kind offer of a jump from $65 to $30 a month, and in a few weeks the kind agent left me in charge, drawing his $90 per month, while he took a long vacation. The very first train order I received was for the conductor who had been the means of having me fired. After patting me on the shoulder, he said:

"'George, you are the coolest fellow I ever accepted a train order from. I do not feel nervous as I frequently do after watching some of the older agents copying them from the tape.'

"Conductor Rathburn proved a good friend, and never missed an opportunity to recommend me for a higher position. But the sad sequel of our first meeting thirty-five years ago ended here in Denver a few years since, when poor Rathburn dropped dead on the street almost in front of our office, at which time he was the oldest passenger conductor on the Denver and Rio Grande, having drifted West a few years after I did.

"My experiences on the Atchison, Topeka and Santa Fe, when that company was struggling with the Indians for a right-of-way through the wilds of Kansas, I shall have to omit, as my duties in the superintendent's office at Topeka were so light in comparison to my salary my conscience bothers me even to this late day when I allow myself to think of it, but if old "Si" Prime was only alive, or if Charlie Dyer, late general superintendent of the Colorado and Southern, was not at present in Chicago, either might tell you all about it. Mr. Dyer was the operator on the front and came pretty nearly earning his salary in the mix-ups he and the graders had with the original owners of the soil.

"While, perhaps, not a practical farmer, it's a heap lot of comfort for a man my age to know that he owns a fairly good slice of Uncle Sam's domain, and I feel very grateful to the company that has given me an opportunity to obtain the same, and in my religious moments it is not always quite clear to me that I do not owe the Western Union something more than thanks and gratitude for these many years of employment."

W. W. Umsted, Western Union Manager at Omaha.

William W. Umsted is the manager of the Western Union Telegraph Company at Omaha, Neb., at which important point he has been in charge for nearly eighteen years. During this long period he has rendered efficient service, maintaining his office at a high standard and proving the excellence of his executive abilities. Mr. Umsted comes from Ohio, and was born at Tiffin, that state, February 12, 1857. When sixteen years of age he became a messenger in the service of the Western Union in his native place. A lad of quick perceptions he soon picked up an acquaintance with telegraphy and a year later,

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in 1874, was placed temporarily in charge of the office at Green Springs, Ohio. In January, 1874, he entered the telegraph department of the Canada Southern Railroad in Michigan, soon after going with the Baltimore and Ohio at Chicago. In the fall of that year the Atlantic and Pacific Telegraph Company opened an office at Tiffin and young Umsted was called back to his home town and placed in charge. At this time W. C. Humstone, now retired and living in Brooklyn, N. Y., was the superintendent of this district and was located at Cleveland. Mr. Umsted having demonstrated his abilities as manager of a small office, was called to Cleveland on April 1, 1875, where just one year later he was appointed night manager of the office. Here he remained for some time, when he accepted the position of chief operator of the American Union Telegraph Company, one of the most important wire points in that company's system. Charles Selden, now superintendent of telegraph of the Baltimore and Ohio Railroad Company, at Baltimore, was manager of the office and superintendent of the district. This company passing under the control of the Western Union, Mr. Umsted received the appointment as manager of the Board of Trade telegraph offices in Toledo, afterward, in 1883, being transferred to Detroit in a similar capacity, having charge, also, of the commercial news department service at that point. This position he continued to occupy until July 1, 1890, when he received his appointment as manager at Omaha, and where he has since resided.

W. W. UMSTED.
Manager Western Union Telegraph Company, Omaha, Neb.

J. R. Terhune, Western Union Superintendent at Nashville.

John R. Terhune, superintendent of the Western Union Telegraph Company at Nashville, Tenn., has made an excellent record during his career in the telegraph service. He was born at Rome, Ga., in 1859, at which point he entered the Western Union employ, beginning as a messenger in August, 1874. He made rapid advancement through the various grades, reaching that of chief operator at Chattanooga, Tenn., from which he

J. R. TERHUNE.
Superintendent Western Union Telegraph Company, Nashville, Tenn.

was promoted to the managership of the Lexington, Ky., office, a post he held for eighteen years, when he was transferred to New Orleans. This was in 1900, and in this larger office with its greater responsibilities, he proved his entire fitness for the trust reposed in him. Late in 1902, Mr. Terhune was appointed assistant superintendent at Nashville, his elevation to the superintendency following on July 1, 1903. In going up the steps to higher positions of increased importance he has carried with him the confidence and best wishes of his official superiors.

D. V. Ferris, Western Union Chief Operator at Syracuse, N. Y.

Daniel V. Ferris, chief operator of the Western Union Telegraph Company at Syracuse, N. Y., was born at Scott, N. Y., February 4, 1838. He

DANIEL V. FERRIS.
Chief Operator, Western Union Telegraph Company, Syracuse, N. Y.

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learned telegraphy at Friendship, N. Y., in 1857, in the employ of the Erie Railroad Company, subsequently entering the service of the New York Central Railroad Company at Syracuse. The Civil War breaking out he went to the front, and from December 25, 1861, to July 1, 1862, was a member of the United States Military Telegraph Corps, in which service he was actively employed in Northern Virginia. Injuries received near Manassas Junction, Va., compelled him to resign, following which he returned to Syracuse. After a brief connection with the Erie Railroad at Hornellsville, N. Y., on May 16, 1863, he entered the employ of the New York, Albany and Buffalo Telegraph Company at Syracuse. He was retained by the Western Union when that company absorbed the former in 1864, and in 1869 was promoted to be chief operator of the Syracuse office. This position he has since held. Mr. Ferris is an expert telegrapher, and his long experience and extensive acquaintance with the demands of the business in which he is engaged have made his services valuable.

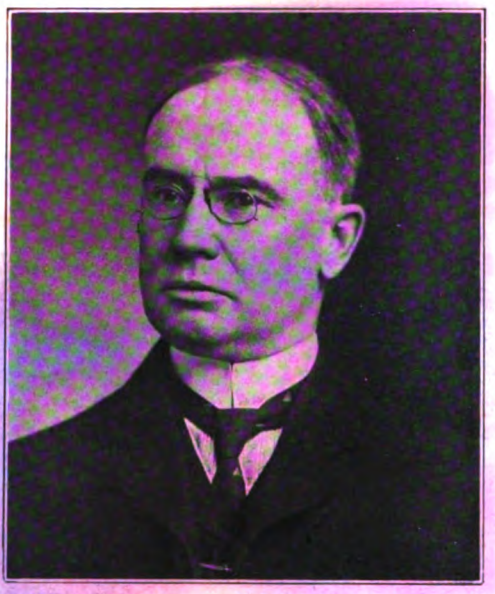
F. H. Tubbs, Western Union Superintendent at Chicago.

Frederick Henry Tubbs, superintendent of the Western Union Telegraph Company, at Chicago, is a native of New York State, his place of birth being Glens Falls, January 3, 1834. He went to Milan, Ohio, ten years later, and there later, under the teaching of J. H. Wade, who afterward amassed great wealth and became president of the Western Union Telegraph Company, young Tubbs found employment as an operator for the Erie and Michigan Telegraph Company, on speed lines. Mr. Tubbs was engaged in opening offices and teaching operators on the Wade highway line from Cincinnati to St. Louis, for two years, then as an operator in the speed office at Cleveland, until he went to Chicago as chief operator on the Caton line. He left that position to accept the superintendency of telegraph of the Chicago, Burlington and Quincy Railroad, a position he held for many years, when he was made assistant superintendent of the road. Later he accepted the superintendency of the American Union Telegraph Company, at Chicago, following which he became superintendent of the Western Union Telegraph Company, at that point, where he now is.

FREDERICK H. TUBBS.
Superintendent Western Union Telegraph Company, Chicago.

W. J. Lloyd, Assistant Superintendent, Western Union Telegraph Company, Chicago.

William J. Lloyd, the assistant superintendent, first district of western division, Western Union Telegraph Company, Chicago, Ill., was born June 21, 1853, at Buffalo, N. Y. He entered the telegraph business as messenger for the Illinois and Mississippi Telegraph Company, at Dubuque, Iowa, at the age of twelve.



WILLIAM J. LLOYD.
Assistant Superintendent Western Union Telegraph Company, Chicago.

Two or three years later he worked as an operator in the trainmaster's office of the Illinois Central Railroad, at Dubuque, and in July, 1869, he became relief operator of this road west of that point. Subsequently he was employed as operator by the Pacific and Atlantic Telegraph Company at Dubuque, and the North Western Telegraph Company under Superintendent Haskins, at Milwaukee. From the latter office he was transferred to McGregor, Iowa, as manager of the joint office of the Western Union and North Western telegraph companies.

His service with the Western Union Telegraph Company at Chicago dates from 1877, when he began as a night operator in the main office. He worked about one year at the key and has since filled the following positions: Night division chief,

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two years; night wire chief, three years; night chief operator, two years; manager of Board of Trade office, three years; chief operator of Chicago main office, three years; when, in 1889, he was promoted to his present position.

Mr. Lloyd is one of the most widely known and popular telegraphers of to-day, having always been in positions which have brought him in close contact with the fraternity, and he is universally esteemed alike both by his superiors and subordinates.

His experience and ability have not been confined to Chicago alone, but the arranging for and handling of the immense business at national political conventions, or, in fact, any other special emergency west of the Alleghany Mountains, is generally placed in his hands, always to the satisfaction of the patrons and officers of the company.

Mr. Saylor, Western Union Superintendent, Pittsburg.

Elgin B. Saylor, Western Union superintendent at Pittsburg, Pa., is a representative type of the best element in the telegraph service. His loyalty to duty, his tact, his zeal, his abilities as a telegrapher are recognized. He is a Canadian, coming from Bloomfield, Ont., where he was born June 11, 1859. His entry into the telegraph service was at Ingersoll, Ont., in 1874, in the employ of the Dominion Telegraph Company. He subsequently had service with the Grand Trunk Railway Company, and the Atlantic and Pacific Telegraph Company, with the latter at Portland, Me. When that company was merged, a year later,

ELGIN B. SAYLOR.
Superintendent Western Union Telegraph Company, Pittsburg, Pa.

with the Western Union his services were retained, in which employ he has since continued. In 1881 he was transferred to the operating department of the Philadelphia office, where, dating from 1884, he was promoted successively to be night chief, wire chief and traffic chief, succeeding in 1887 to the position of chief operator. This place he continued to hold through a series of years, until the spring of 1901, when he was transferred to the office of the general superintendent in the main office at New York, from whence he went to Pittsburg to accept the appointment of superintendent. Mr. Saylor, who is conceded to be one of the finest operators in the United States, and an accomplished electrician, has made a favorable individual impression in his present position. He is a brother of A. G. Saylor, assistant general superintendent at New York.

J. F. Wallick, Superintendent, Western Union Telegraph Company, Indianapolis.

John Fahnestock Wallick, superintendent of the Western Union Telegraph Company, at Indianapo-

JOHN F. WALLICK.
Superintendent Western Union Telegraph Company, Indianapolis, Ind.

lis, Ind., is the dean of that body of men in the company's employ, for his appointment to the office he still holds dates back to January 1, 1864. He was born in Tuscarora Valley, Juniata County, Pa., March 20, 1830.

He entered the telegraph service at Wooster, Ohio, in 1850, with Gen. Thomas T. Eckert. Mr. Wallick was appointed manager of the Cincinnati and St. Louis Telegraph Company at Indianapolis, Ind., in July, 1852.

After the consolidation of offices of the Cincinnati and St. Louis with the Ohio, Indiana and Illinois telegraph companies at Indianapolis, in May, 1853, he wes employed as operator in the consolidated office, under the management of J. W. Chapin. He succeeded Mr. Chapin as manager in September, 1853, and continued as manager until its absorption by the Western Union Telegraph Company in October, 1856, when he was appointed manager of the latter company. Mr. Wallick was appointed superintendent of sixth district, central division (now western), of the Western Union Telegraph Company, January 1, 1864. He has been in continuous service with the companies named from July 26, 1852, to the present time.

The Edison telephone exchanges at Indianapolis, Evansville, La Fayette and Richmond were constructed for the Western Union Telegraph Company under the supervision of Mr. Wallick, and

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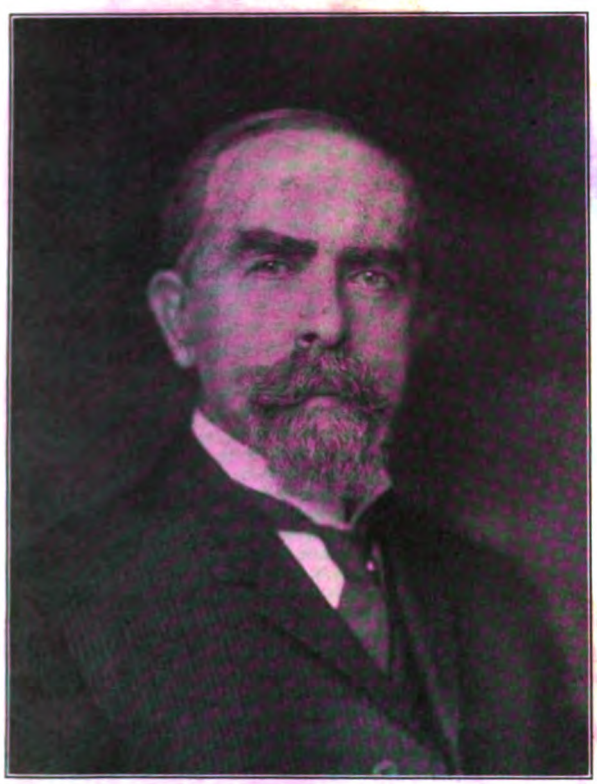
he is now, and has been since its organization, a director in the Central Union Telephone Company.

Mr. Wallick is a veritable storage house of Western telegraph history, his long and intimate connection with the service putting him in possession of much valuable and interesting information.

Richard O'Brien, Assistant Superintendent, Western Union Telegraph Company, Scranton, Pa.

Richard O'Brien, assistant superintendent of the Western Union Telegraph Company, at Scranton, Pa., was born in Ireland, December 30, 1841. He began his telegraph career on the Pennsylvania Railroad in 1856, at Downingtown, Pa., subsequently serving in many of the important offices of the Pennsylvania Railroad, including Altoona, under Thomas A. Scott, Andrew Carnegie and Robert Pitcairn. At that time Tom Carnegie,



RICHARD O'BRIEN.
Assistant Superintendent, Western Union Telegraph Company, Scranton, Pa.

John Pitcairn and Richard O'Brien composed the entire operating force at Altoona. Mr. O'Brien afterward served as operator and assistant agent at Greensburg, Pa.

The outbreak of the Civil War found him division operator of the middle division of the Pennsylvania road, at Harrisburg, Pa.

On April 22, 1861, Mr. O'Brien, with David Homer Bates, David Strouse and Samuel Brown, were called to Washington in compliance with a telegram of that date signed Andrew Carnegie, who had just been appointed assistant general manager, United States military telegraphs.

Arriving in Washington on April 25, 1861, Mr. O'Brien was first assigned to duty at the Baltimore and Ohio Railroad depot, assisting Andrew Carnegie in rushing troop trains into Washington until there were soldiers enough there to safeguard the capital. On August 4, 1861, he was appointed chief operator, headquarters Department of Virginia, at Fortress Monroe; on May 1, 1864, chief operator Army of the James, and on February 2, 1865, he was sent as chief operator to the Department of North Carolina to prepare and manage the military lines in the final campaign when Sherman swept up from the South.

For his efficient and patriotic services, Mr. O'Brien received the thanks of General Eckert, the head of the military telegraphs, and of the generals in the field.

At the close of the war, General Eckert appointed Mr. O'Brien superintendent of lines on Long Island. He was later made superintendent of telegraph of the Morris and Essex Railroad, and for many years has been assistant superintendent for the Western Union Telegraph Company at Scranton, Pa.

He was the pioneer of the Bell telephone in Northeastern Pennsylvania, and one of the founders of the Peoples National Bank of Scranton.

Mr. O'Brien has always won the respect and confidence of all who have been associated with him by his untiring devotion to duty, by his polish of manner and unswerving devotion to truth and honor. In all of these qualities and in his extraordinary capacity for work, he has been a worthy member of the remarkable coterie of brainy men who made the United States military telegraph and have since so largely contributed to the wonderful advance of the telegraph, the telephone, and other enterprises of this country.

L. J. Maxwell, Western Union Superintendent at Richmond.

Lewis J. Maxwell, superintendent of the first district, southern division, of the Western Union

L. J. MAXWELL.
Superintendent Western Union Telegraph Company, Richmond, Va.

Telegraph Company, Richmond, Va., was born at Griffin, Ga., May 27, 1865. Like many another

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who has attained high position in the telegraph service, he has climbed the ladder of promotion from the lowest round. His entry into telegraph employ was in his native town in August, 1878, in the capacity of messenger. He soon became able to telegraph and was appointed an operator. He made his business a study and the work performed by him was well done. Promotion followed and he was appointed a chief operator. In this position his executive abilities became manifest, and it was natural that he should be made a manager. From this office he was still further advanced to the post of assistant superintendent, succeeding to that of superintendent about three years ago. Mr. Maxwell is giving an efficient administration.

Charles R. Tilghman, General Inspector.

Charles R. Tilghman, a general inspector attached to the office of Assistant General Manager J. C. Barclay, of the Western Union Telegraph Company, New York, is a native of Cincinnati, O., his

C. R. TILGHMAN.
General Inspector, Western Union Telegraph Company, New York.

present home, where he was born September 9, 1855. His advent into the telegraph service was in his home city in August, 1869, where he began as a messenger. Graduating into the operating ranks, he afterward became an inspector of the Gold and Stock Telegraph Company, later managing the Edison telephone exchange for the Western Union Telegraph Company. Subsequently he became manager of the time service, electrician for the seventh district, finally serving as acting assistant superintendent. He has filled his present position for several years.

M. W. Hamblin, City Superintendent, Western Union Telegraph Company, New York

M. W. Hamblin, city superintendent of the main office of the Western Union Telegraph Company, New York, came to the metropolis from the West. He was born at Galesburg, Ill., February 23, 1860, was educated in the public schools of his native place and there studied telegraphy in a commercial school. In 1876, at Abingdon, Ill., he further pursued the study of telegraphy combined with railroading, under F. O. Davis, the agent at that point, acting as helper, delivering messages, riding eighteen miles a day, for which, he says, he paid railroad fare for the privilege. In November, 1877, he was appointed night operator and ticket clerk for the Chicago, Burlington and Quincy Railroad at Monmouth, Ill., and in 1880 was transferred and given the position as manager of the Western Union main office in that city. Here his fine executive abilities were established and his reputation as a successful manager secured for him numerous other places of like character in the Western Union service. These in sequential order were: Janesville, Wis., from June, 1883, to March, 1886; Bloomington, Ill., to October, 1889; Davenport, Iowa, to February, 1899. At the latter date he was transferred to the larger office at Milwaukee, Wis., where his record made such a favorable impression as to lead to

M. W. HAMBLIN.
City Superintendent, Western Union Telegraph Company, New York.

his appointment as manager at New York in 1902, the title to which office was changed in October, 1906, to that of city superintendent.

Combination of Telegraph and Mail Service in Cuba.

A. Campbell Turner, charge d'affaires of the American legation at Havana, forwards copies of three decrees of the provisional governor of Cuba, establishing state telegraph offices, to be connected with the post offices in the following places in Pinar del Rio province: Orozco, Quiebra Hacha and Cabanas. In these offices the postmaster is to be required to pass an examination as telegrapher and is to fill both posts. It is proposed in the future, in all the smaller towns in the interior of the island where the work of the post office will so permit, to combine the offices of postmaster and telegrapher and to make applicants for these positions pass an examination in telegraphy before receiving their appointment.

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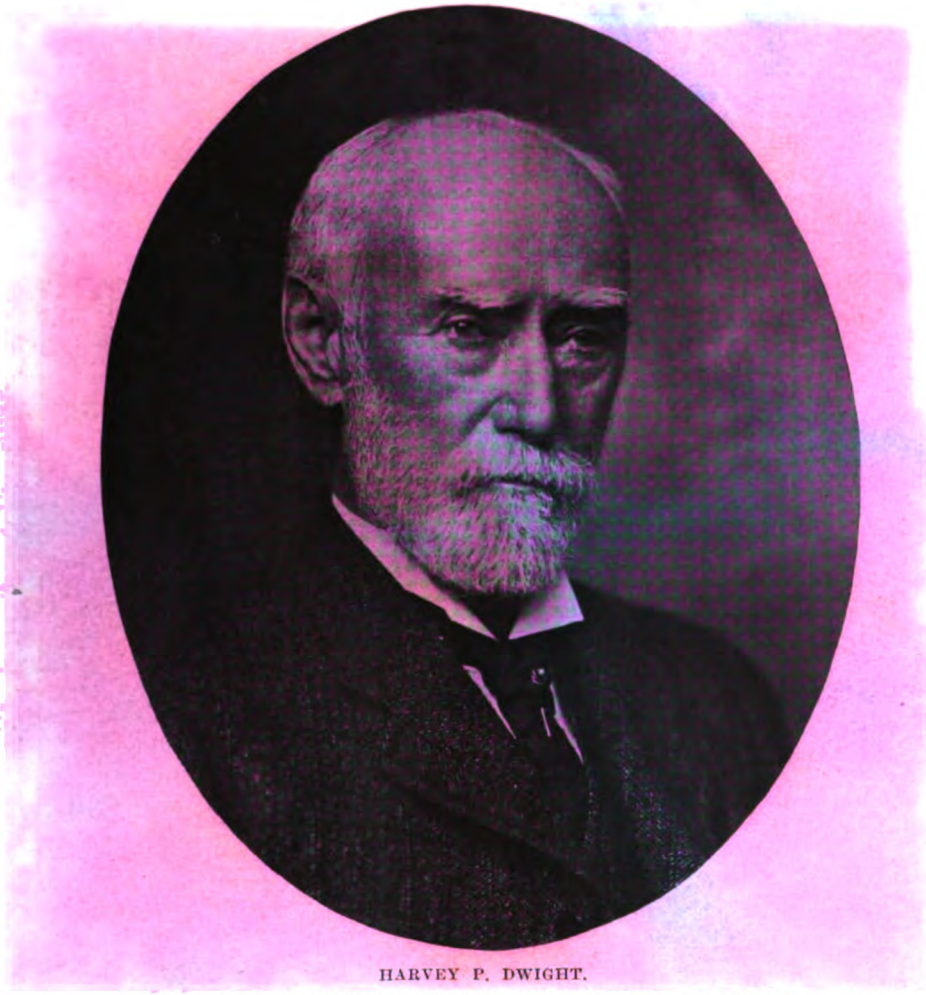

HARVEY P. DWIGHT.

President of the Great North Western Telegraph Company, Toronto, Ont.

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ISAAC McMICHAEL.

Vice-President and General Manager of the Great North Western Telegraph Company, Toronto, Ont.

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The Great North Western Telegraph Company.

The story of telegraphic extension is always an interesting one, for it marks the advance of civilization, presaging development and growth, promoting enterprise and territorial expansion in its actualities, holding people and nations in closer union, stimulating patriotic desire and impulse. This has been its history in all countries, but more especially on the North American continent, where in the exercise of its greatest prerogatives the telegraph has reached its highest fruition. The narrative of the introduction of the telegraph and of its subsequent extension in the vast territory of the Canadian Dominion at the North, is one of commanding importance. Its recital appeals with peculiar force to individuals in the telegraph service on each side of the border because of the community of interests, of the frequent interchange witnessed in personnel between the respective systems, each country apparently viewing its importations from the other as embodying as a rule the "better element."

While this article is designed more especially as a chapter in telegraph history having reference to the Great North Western Telegraph Company, it would manifestly be incomplete in its telling if something of the early account of the telegraph in Canada, with which the evolution of the latter company is closely involved, was not reverted to, at least in brief outline. For this great system is a direct outgrowth of what had gone before and was formed by the merging of important rival interests into a more compact, extended and effective whole, thereby smoothing out rivalries and carrying forward in a single united organization, since recognized as of the first class, giving to Canada and to this continent a system of telegraph wide in extent, reaching from the Atlantic ocean at the East to points in the Far West, with affiliations enabling it to communicate with all points in America and the world, and conducted under a management at once strong, alert and progressive.

GENERAL OFFICES.
Great North Western Telegraph Company.
Toronto, Ont.

Looking backward to the first advent of the telegraph in Canada involves a retrospect of more than sixty years. Closely following the construction of the first line of telegraph in the United States, which was accomplished in the spring of 1844, and which the delayed action of a reluctant Congress had then made possible, the utility of

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this new form of transmitting intelligence by means of the electric current over a wire, gained commercial recognition in Canada.

The first line to be built was that of the Toronto, Hamilton, Niagara and St. Catherines Electro Magnetic Telegraph Company, a long name for a comparatively short line. This was in 1846. The company was capitalized at $16,000. Samuel Porter was the constructor and superintendent of the line, and it was said to have been well built, its single wire being amply sufficient to accommodate the limited number of messages handled. Connection was made between Canada and the United States by a wire suspended across the Niagara River between Queenston and Lewiston on the New York side, from which latter point Buffalo was reached and communication established with the then inconsiderable American systems, consisting mainly at that point of connection with the new line of the New York, Albany and Buffalo Telegraph Company. While commercialism dictated the building of the first line of Canadian telegraph to afford closer connection between the two countries, it was also a fitting tribute to the sentiment involved that the route should find an outlet in the country that gave to the world the great invention of the magnetic telegraph.

The following year of 1847, however, witnessed a further purpose to extend telegraph building in Canada, and the Montreal Telegraph Company, from its very inception destined to play so important a part in the Canadian telegraph field, was organized with a capital of $60,000 and Andrew Shaw as its first president. The line was projected to traverse the most populous portion of Canada and extraordinary vigor was manifest in pushing its construction, for beginning about the middle of the year, before its close a single line of No. 9 galvanized iron wire had been erected between Toronto, Montreal and Quebec, following close to the north shore of Lake Ontario and the River St. Lawrence. This labor of construction, while performed by American contractors, who had previously executed similar work in the United States, was done under the supervision of Orrin S. Wood, a young American of energy and capacity, a native of the State of New York, who in the previous spring had been made superintendent of the company and in whom the general management speedily became invested. He was one of the few men who at that time had any practical knowledge respecting the art of telegraphy itself and of telegraph line building. He had been associated with Professor Morse, the inventor of the telegraph, as an operator at Washington, on the first line ever built, and had afterward been extensively engaged in the erection of telegraph lines, among the first in the United States. It is interesting to note in this connection that Mr. Wood is still living in New York at the advanced age of ninety years, the oldest living telegrapher in the world. He remained with the Montreal Telegraph Company, an important and influential factor in directing its affairs for eighteen years. Shortly after Mr. Wood became identified with the company, H. P. Dwight entered the service, and later James Dakers.

At the close of 1847 it is recorded that the Montreal Telegraph Company worked five hundred and forty miles of wire, had nine offices, employed thirty-five persons and had sent 33,000 messages during the half-year of its existence. It is said that the first message sent from Montreal over the wires of the new company was one addressed to J. H. Daly, at that time a keeper of an hotel at Kingston, Ont. The scant earnings of the telegraph at that early period of its history are shown by the total amount received daily in tolls over the entire line. Thus for August, 1847, the average was $35; September, $45; October, $80; November, $90, while for December the amount dropped to but $65, a contraction due possibly to the advent of winter and of cold weather.

Toronto has always divided the honors with Montreal as to being a center of telegraphic importance. How narrow the measure of its activity in 1849 as compared with its present day energies, may be judged when it is stated that the services of but a single operator at that time were all that was required to handle the entire telegraph traffic at that point, both of the Montreal Telegraph Company leading eastward, and of the line to Buffalo which prior to that date had been acquired by the larger corporation, an illustration of the survival of the fittest thus early inaugurated, and which has since been so abundantly witnessed in telegraph development. This solitary operator was Harvey P. Dwight, then a young man of twenty-one years of age, now the venerable president of the Great North Western Telegraph Company, whose picture adorns one of the pages of this sketch. Mr. Dwight says that during the entire year, 1849, he personally handled every message sent and received at the Toronto office, copying with his own hand every message which came to that city, reading carefully every message twice to make sure that the copying had been done correctly. It may be assumed that but few press specials came over the wires at that period, and that financial interests, as shown in broker messages, placed no tax upon the resources of the telegraph companies.

By 1851, fourteen offices had been established on the route of the Montreal Telegraph Company between Toronto and Quebec, and among the operators stationed at some of these places, names that will be readily recognized in subsequent connection with the telegraph service, were the following: George W. Purkis, at Quebec; William Smith and George Smith, at Montreal; Charles K. Ogden, at Three Rivers; G. H. Hickey, at Cornwall; Isaac D. Purkis, at Prescott; H. P. Morehouse, at Kingston, and H. P. Dwight, as already stated, at Toronto. The other offices were Brockville, Belleville, Cobourg, Port Hope, Bowmanville, Whitby and Oshawa, where Dr. Irvin was in charge.

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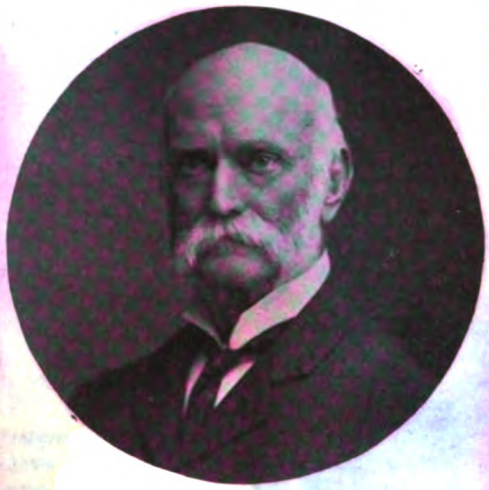
EDWIN POPE.
Superintendent Great North Western Telegraph Company, Quebec, Que.



R. F. EASSON.
Superintendent Commercial News and Press Department, Great North Western Telegraph Company, Toronto, Ont.

SIDNEY B. McMICHAEL.
General Assistant Great North Western Telegraph Company, Toronto, Ont.

J. G. DAVIES.
Manager Great North Western Telegraph Company, Ottawa, Ont.

THOMAS E. DUDLEY.
Manager Great North Western Telegraph Company, St. Catharines, Ont.

W. C. FURNESS.
Manager Great North Western Telegraph Company, London, Ont.

P. F. CANNIFF.
Manager Great North Western Telegraph Company, Belleville, Ont.

J. BEAUCHAMP.
Inspector Great North Western Telegraph Company, Quebec, Que.

JOHN JAMIESON.
Manager Great North Western Telegraph Company, Hamilton, Ont.

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The provincial character of the business and of the methods pursued in telegraph practice at that time is shown in the fact that sometimes when important reports were received by wire at the Toronto office, editors of papers would attend at the telegraph office in person and copy all such messages as Mr. Dwight would read them off.

In this same year of 1851, Sir Hugh Allan, from the first identified with the Montreal Telegraph Company, became its president, a position he retained for many years. He displayed great activity in this position and was prominent not only in the telegraph but in railroad building and in ocean steamship enterprises, eventually amassing a vast fortune from his undertakings. The Allan line of ocean steamers derived its name from Sir Hugh. He became interested in the first Atlantic cable, and for many years was a director in the Western Union Telegraph Company. In Sir Hugh Allan Mr. Wood found a worthy coadjutor, and together they projected and carried out many important extensions to the telegraph line.

Naturally the extension of the telegraph in those early days was comparatively slow, beset by many difficulties, hampered by the reluctance of capital to embark in an enterprise that even then failed to arouse enthusiasm and confidence to the point necessary to freely enlist money backing. Then, again, there were but few who were really competent to lead in enterprises of this character, to convincingly demonstrate the vast potentialities for success and gain that lay within the power and scope of the telegraph. It should be remembered, too, that the country was young and sparse of population; that there were but two or three large towns; that industries were not so many or varied as in later years inviting and making imperative the use of the telegraph; that business was conducted along narrower and more conservative lines and did not readily adjust itself to the novel methods afforded and held out for adoption by the telegraph for quick transmission of information, now regarded as a *sine qua non* by the commercial world; and, also, that capital, at best but modest in amount, was lodged in the hands of but a few. Nevertheless steady progress was made in telegraph construction, its area was constantly enlarged, slowly at first, then by leaps and bounds as stronger companies succeeded weaker ones and merging interests contributed to establish power and guarantee security.

Contemporary with the initial building of the Montreal Telegraph Company, a company known as The British North American Electric Association, in which Frederick Gisborne was interested, began the erection of a telegraph line designed to connect Quebec with the Atlantic Coast at New Brunswick and Nova Scotian points. It had a checkered, unproductive career, with original plans only partially carried out, and after a few years of feeble effort passed into the control of the Montreal company.

In 1849 the Montreal and Troy Telegraph Company was organized under the presidency of H. H. Whitney, of Montreal, and a line was built from that city to the Canadian frontier, thence reaching Troy, N. Y., by what was known as the Troy and Canada Junction Telegraph Company. These lines were constructed by Ezra Cornell, the founder of Cornell University, and Alonzo B. Cornell, father and son, the latter afterward becoming Governor of the State of New York. Norman W. Bethune was placed in charge of the office at Montreal, subsequently becoming manager at Troy. He is still, at the age of seventy-nine years, in telegraph employ at Ottawa, Ont. This line was absorbed by the Montreal company which likewise took over the lines of the Vermont and Boston Telegraph Company, from Rouse's Point to Montreal and Ogdensburg, N. Y., thus acquiring valuable southern connections into the United States and stations within its territory, ever since retained.

At this time there were no bridges over the St. Lawrence River, nor were there any submarine telegraph cables. The telegraph wires were carried across the water, being strung from high masts. To maintain these crossings was an expensive and hazardous operation, for frequently gales of wind and storms of sleet brought down the wires.

Up to 1853 there were but three sets of instruments in the Montreal office—one for Toronto, one for Quebec and one for Troy. William Smith worked the Toronto circuit, and George Smith that to Quebec.

Another short line of telegraph, poorly constructed and that never paid, extending from Montreal to "Bytown," now Ottawa, the Dominion capital city, soon also came under control of the Montreal company. In 1852 the Grand Trunk Telegraph Company was built from Buffalo to Montreal, under the guise of being a great public benefaction, and gave promise of a lively competition with the Montreal company, but after a few years this, too, passed under the control of the latter. Practically over the same ground the Provincial Telegraph Company was constructed, designed to be operated as a branch of the United States Telegraph Company. This was a longer-lived experiment than its predecessor, for it was as late as 1866, when because the United States company was taken over by the Western Union Telegraph Company, the Provincial company sold out to the Montreal. Thus it will be seen that the Montreal Telegraph Company had demonstrated a power and strength in overcoming opposition and gathering in to itself other and rival lines. Yet it must be admitted that in all cases opposition had been weak, life and vitality at low ebb and all interests were better conserved by means of a single operating corporation. The Montreal company was financially strong, its lines covered the best portion of Canada, and it rendered good service.

In 1865, when Mr. Wood resigned from his

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long connection with the Montreal company, Mr. Dwight was advanced to the position of general western superintendent, with headquarters at Toronto, and James Dakers became general eastern superintendent, stationed at Montreal.

The growth of the Montreal Telegraph Company developed rapidly and by 1870 this system operated about 20,000 miles of wire, which by 1880, such was its extension during the decade, that it had probably advanced to 30,000. Lines were built to connect interior towns; to reach the harbors on the lakes; were pushed into the Northwestern peninsula of Ontario; into the lumbering districts of Ottawa, and down through the eastern townships of Quebec. New York State had been invaded, and a network of lines established which serves that territory at the present day. Mr. Dwight, in his capacity of western superintendent of the company, was indefatigable in his efforts to extend and promote the interests of his company. His practical and energetic methods, coupled with excellent business acumen, enabled him to accomplish much. The company expanded into one of very large proportions; its lines united the Atlantic coast with points in the Far West. It was the dominant company of the Dominion. For thirty-four years it maintained its supremacy.

The affairs of the company had been exceptionally well managed, and in June, 1871, when free from all indebtedness and with large, substantial and well-appointed central offices erected, the adoption of a uniform tariff of twenty-five cents for ten words and one cent for each added word, throughout its entire territory, went into effect. The only exception to this charge was its limitation to fifteen cents on all messages to places within fifteen miles of any given office. By 1881 the capital of the company had increased to $2,000,000, the number of offices to 1,680, and the staff of employees to nearly 2,500. At this time Sir Hugh Allan continued still to hold the office of president; James Dakers occupied the dual position of secretary and general eastern superintendent; H. P. Dwight, as already stated, was the general western superintendent, the district superintendents being N. W. Bethune at Ottawa; Edwin Pope at Quebec, and D. Van Nostrand at Watertown, N. Y.

Railroad building had given an immense impetus to telegraph extension, for wherever the rails were laid telegraph construction naturally followed. The field for the exploitation of telegraph enterprise was looked upon as a tempting one, and, in view of this fact, it was not surprising that determined opposition should arise to Montreal Telegraph Company interests. In 1868 the Dominion Telegraph Company was organized, but on a basis that only invited disaster. In January, 1870, however, a permanent organization, or perhaps more properly speaking, a reorganization, was effected at a meeting held at Toronto, and public favor in behalf of the enterprise was sought by electing such men to its management as Hon. J. McMurrick, of Toronto, president; J. I. McKenzie, of Hamilton, vice-president; James Michie, of Toronto, treasurer, and H. John Colles, secretary. Because of irregularities prior to the 1870 organization, a special act of incorporation was passed by the Dominion Parliament in order to legalize the standing of the corporation. The company was controlled by energetic men and from the first proved to be the most formidable competitor the Montreal company ever had encountered. The new concern proceeded to establish a system of wires to principal places in Ontario and Quebec. By 1878, with a capital of $700,000, it had extended its lines to the Maritime Provinces, and at the close of that year claimed to have 492 offices and over 8,000 miles of wire. By its means Detroit, Buffalo and Oswego were brought in close connection with Quebec. This was creditable to the enterprise and push of those directing its affairs. At this time Hon. T. N. Gibbs, of Oshawa, had succeeded to the presidency of the company, Thomas Swinyard was general manager, and Fred Roper, secretary, the main office being at Toronto. The divisional superintendents were H. Neilson and T. C. Elwood, Toronto; C. R. Hosmer, at Montreal, and D. B. McQuarrie, Halifax.

In an evil hour the management of the Dominion company decided, as a bid for popularity and business, to reduce its rates from twenty-five to twenty cents per average message. Its downfall dated from that time. Of course the Montreal Telegraph Company, in order to hold its business, was obliged to follow suit, the result being that in the war of rate competition that followed, business being accepted below a proper, safe and profitable working margin, both companies became seriously crippled. The weaker company was the first to succumb, for this condition of affairs so wrecked its finances as to cause in 1880 a lease of the wires of the Dominion company to be executed to the Western Union Telegraph Company, under a guarantee of five per cent. to be paid to shareholders. This transfer of interests did not, however, stop a competition which the Montreal Telegraph Company was still forced to meet, and which now was pressed harder than ever in a manifestly unequal fight so far as power and money resources was concerned.

At this critical juncture, in 1881, Erastus Wiman, who afterward lived in New York, where he gained business and social prominence, and where he died, appeared upon the scene, and through his instrumentality exerted as a pacificator of warring interests, and by the exercise of that executive ability that afterward brought him power and recognition, succeeded in forming a new company, organized to take over the two rival corporations. This was the Great North Western Telegraph Company which became through lease, covering a period of ninety-nine years, the operating company, under the guarantee of the Western Union Telegraph Company.

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of both the Montreal Telegraph Company and of the Dominion Telegraph Company. The provisions of this lease included the payment of eight per cent. on the stock of the Montreal Telegraph Company and of six per cent. on that of the Dominion Telegraph Company. Virtually by this adroit maneuvering the new organization became a part of the system of the Western Union Telegraph Company, with which it has since been operated with a harmony of interest.

Thus, with the closing of the old regime, came into existence the powerful telegraph company which has in the eventful twenty-six years following this consolidation, impressed itself so forcibly in telegraphic annals in British North America.

The new Great North Western Telegraph Company started out upon its career under the general management of Harvey P. Dwight, whose intimate association with this telegraphic enterprise from its very start eminently fitted him for this position. Mr. Dwight was alert to the every need of the undertaking, and the company, freed from needless and ruinous competition, entered upon an era of prosperity. This was further and especially manifest after Mr. Dwight was elevated to the presidency in 1893. Firm in financial standing, established in public good will, secure in its environment and ability to furnish a first-class telegraph service, the company greatly extended its lines, maintaining its equipment fully abreast of all ideas of modern requirements.

Mr. Dwight had given a long life to the service of which he was now the head. Advancing years at length admonished him that the time had arrived when he should relinquish some of the burdens of office and transfer a share of the responsibilities of management to other hands. Hence it was that on November 1, 1903, Mr. Isaac McMichael was appointed to the office of vice-president and general manager of the system, resigning as superintendent of the Western Union Telegraph Company at Minneapolis, Minn., to accept the position, Mr. Dwight retaining the presidency of the company. Under the able administration of Mr. McMichael, who has abundantly demonstrated his managerial abilities, thus testifying to the excellence of the school in which he received his telegraph training, it is to be particularly noted that during the four years since he took hold considerable improvement has been made in the plant of the company by the erection of a number of first-class wires to meet the requirements of the service, especially for cable business to Halifax, St. John and North Sydney. Other new wires have been erected between Toronto and Montreal, Toronto and Detroit, etc. These improvements have fully kept pace with the generally improved business conditions throughout Canada, which, during the last two years, has experienced a condition of prosperity heretofore unknown in its history.

The lines operated by the Great North Western Telegraph Company practically cover all of the Province of Ontario east of Lake Huron and the St. Clair and Detroit rivers, all of the Province of Quebec, and a very considerable portion of the Province of New Brunswick. They also extend eastward to Portland, Maine, over the Grand Trunk Railway; also over all that portion of the State of New York north of Whitehall and Oswego, including all of the Adirondack Mountain section, besides extending from the international boundary to Winnipeg, Portage la Prairie and Brandon, in the Province of Manitoba. The company operates about 14,000 miles of poles and about 50,000 miles of wire. A considerable portion of these lines are on highways extending to interior points which have not yet been reached by railroads. The company maintains about 1,650 offices, of which about 200 are in the United States. Of these those located at Toronto, Montreal, Quebec, Ottawa, Winnipeg, Hamilton and London, in Canada, and Ogdensburg, Watertown and Plattsburg, in New York, are the principal ones. At the four first named points the company owns its office buildings, the Toronto headquarters and the structure at Montreal affording examples of architectural merit and of adaption to the needs of the telegraph, embracing in both instances fine, large, well-lighted operating rooms furnished with an extensive equipment strictly modern in respect to every detail. In fact, the excellence of apparatus, of appointments and of maintenance is observable everywhere throughout the entire system, one of the best evidences of capable, careful and intelligent management.

Quadruplex and duplex circuits are operated as follows: Toronto to Montreal, Ottawa, Buffalo, New York, Detroit and Chicago. Montreal to Ottawa, Quebec, Halifax, St. John, North Sydney, New York and Boston. Winnipeg to St. Paul, Minneapolis and Chicago.

The general offices of the company are located at Toronto, Ont. The principal officials are as follows:

H. P. Dwight, president; I. McMichael, vice-president and general manager; Geo. D. Perry, secretary-treasurer and superintendent of supplies; A. C. McConnell, auditor; S. B. McMichael, general assistant; W. J. Duckworth, superintendent of construction; James Ianson, general foreman, and D. E. Henry, chief clerk, general manager's office.

Edwin Pope is the district superintendent, stationed at Quebec, and A. R. Porte holds a like position at Ogdensburg, N. Y.

The inspectors are: C. W. Dawzy and C. E. Lillie, at Toronto, Ont., and J. Beauchamp, at Quebec. The principal offices of the company are efficiently managed by the following staff of local officials: Toronto, G. Hogarth, manager, and C. E. McManus, chief operator; Montreal, L. S. Humes, manager, and G. Sallaway, chief operator; Quebec, E. Pope, manager, and J. Barclay, chief operator; Ottawa, J. G. Davies, manager, and C. E. Davies, chief operator; Winnipeg, S. Hutchinson, manager; Hamilton, J. Jamieson, manager; London, W. C. Furness, manager;

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Ogdensburg, A. R. Porte, who is the superintendent at that point, is also the manager; Watertown, C. E. Comstock, manager, and Plattsburg, W. A. Crooks, manager.

Harvey P. Dwight, President Great North Western Telegraph Company.

Harvey Prentice Dwight, president of the Great North Western Telegraph Company, Toronto, Ont., has often been referred to in these columns, for he holds an honored place in the annals of Canadian telegraphy, and in the affection and esteem of a wide circle of friends, both in and out of the telegraph. He was born at Belleville, Jefferson County, N. Y., December 23, 1827, so that it will be observed that he has just passed his eightieth birthday. Mr. Dwight has been in telegraph harness all his life, starting in it when the business was young, on August 27, 1847, over sixty years ago, as an operator for the Montreal Telegraph Company at Montreal, Que. His advance has been from the lowest to the highest position in the gift of the telegraph. During all these years he has devoted his fine intellectual and business abilities to the promotion of the vast interests in which he has been associated. In the sketch of the Great North Western Telegraph Company preceding, frequent reference will be found to Mr. Dwight and the conspicuous part he played in the telegraphic upbuilding in his adopted country. From operator to manager of the Toronto office, and to the position of western superintendent, in which under his supervision the company made rapid extension of its lines, is in brief the record of his connection with the old Montreal Telegraph Company's system; his association with the present company, down to this time, including its general management from 1881, the date of the merger, and his subsequent elevation to the presidency, retiring from the former position only, in 1903, in favor of Mr. McMichael, constitutes the unbroken yet second epoch of his telegraphic career. Mr. Dwight's life work has been ably performed. In his old age he has earned a season of repose. Everywhere the kindly interest shown, the love and respect expressed, voice the judgment, "Well done, thou good and faithful servant." Few there are when nearing the close of a long and active career in which great results have been accomplished by the exercise of those forceful qualities that alone can insure success, who may look out with serenity upon the world and receive loving homage.

Isaac McMichael, Vice-President and General Manager, Great North Western Telegraph Company.

Isaac McMichael, vice-president and general manager of the Great North Western Telegraph Company, Toronto, Ont., returned to his own when he assumed the duties of this position. He is a cosmopolitan in the best sense; a Canadian by birth, but an American by training, thus representing in his personality a happy blending of sentiment and fact that should profit with equal good fortune by the example set by Mr. Dwight, who is an American by birth yet a Canadian by adoption.

Mr. McMichael was born at Brantford, Ont., January 7, 1840. His telegraphic career began in 1856, when he entered the service of the Brantford and Goderich Telegraph Company. This initial work was soon over and coming to the United States, where greater opportunities were offered him, we find him at twenty years of age, in 1860, located at Piqua, in Ohio, the nearest state across Lake Erie, from his old home. Going thence to St. Louis, at the first outbreak of the Civil War, he entered the United States military telegraph service. His early duties were in the field as operator for Generals Fremont and Pope in central Missouri, and afterward in St. Louis, Little Rock and at Fort Smith, Ark.

At the close of the war Mr. McMichael entered the service of the Western Union Telegraph Company, at Kansas City, afterward going to St. Louis, at which latter post he was, in 1869, appointed chief operator, and in 1870 chief clerk to Col. Robert C. Clowry, now president and general manager of the Western Union Telegraph Company, but who at that time was superintendent of the Western Union, a position he had been appointed to in 1866 when he retired from the United States military telegraph service. The acquaintance and friendship between the two men who have risen so rapidly in the telegraph service, dates from this period. Mr. McMichael had a "natural aptitude" for the telegraph, and for the management of its interests. He had a quick grasp for details; he was familiar with facts and figures, and back of it all he was an accomplished telegrapher. He was a valuable man; his services were in demand. In 1874 he was appointed assistant superintendent. This promotion placed him in a field where his genuine abilities had a larger scope and a freer play. For seven years he remained at this post, quietly at work and gaining that fund of experience that later was to stand him in such good stead. In 1881 a new district of the Western Union company was organized with headquarters established at Minneapolis, Minn. Of this Mr. McMichael, on July 1, 1881, was appointed superintendent, there remaining for twenty-two years.

At this time the retirement of H. P. Dwight from the general management, although retaining the presidency of the Great North Western Telegraph Company, made it necessary to find some one to take his place. The choice of a successor fell on Mr. McMichael, who was elected vice-president and general manager of the company. This was in October, 1903, since which time Mr. McMichael has had the direction of the affairs of this great telegraph system. He has introduced many improvements in the system, bringing it up to a high state of efficiency, and is pursuing a policy in its management that stamps him as an intelligent, progressive and able manager.

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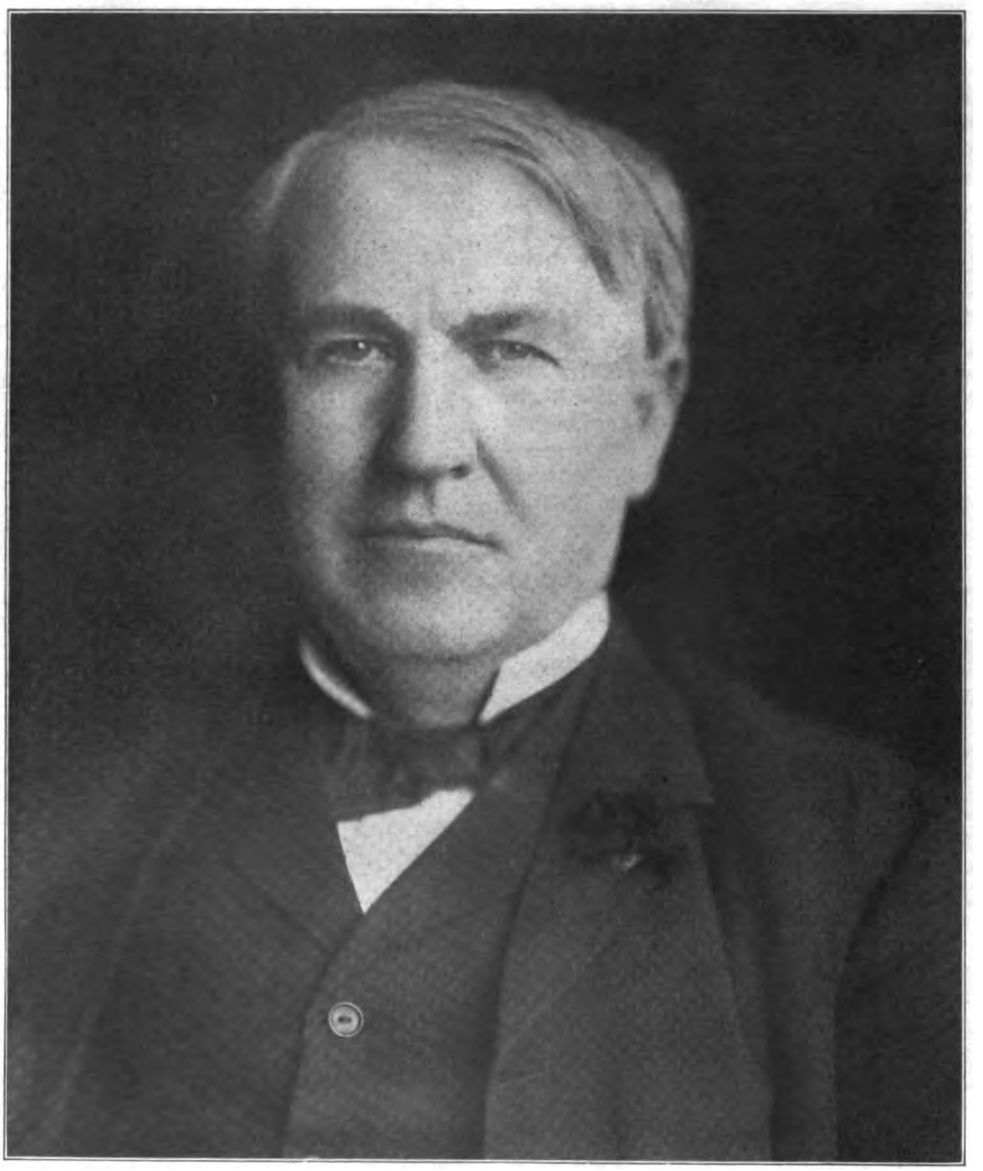

Thomas A. Edison

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Thomas Alva Edison.

This distinguished telegrapher and inventor, was born at Milan, Ohio, February 11, 1847. The family is noted for its longevity. He derived his education from the lessons given him by his mother. At twelve years of age he began his business career as a newsboy on the Grand Trunk Railway. Besides supplying the towns between Detroit and Port Huron with the news of the day, he was conducting a book store, a vegetable store and a news-stand in the town of Port Huron. Early in the year 1862 Edison purchased a lot of type and transferred it to his "den" in the baggage car, and proceeded to issue the Grand Trunk Herald. The paper ran through about forty numbers. Paragraphs from this journal were quoted in the London Times, and the celebrated engineer George Stephenson, as he was traveling on the train, once bought a copy, and took occasion to compliment young Edison for his enterprise. Edison's "sanctum" in the baggage car, was also used by him as a chemical laboratory. On one unfortunate day, when engaged in some experiments, he upset a phosphorus bottle and set the car on fire, in consequence of which he was summarily ejected.

He now turned his attention to telegraphy. One day standing on a platform of the station at Mount Clemens, Mich., he saw the son of the station master in danger of being run over by an approaching train. Springing to his assistance, Edison succeeded in getting the boy off the track, and the child's father out of gratitude taught Edison telegraphy, and here his career as an operator commenced. He rapidly acquired the art. From Mount Clemens Edison went to Port Huron. The operator in the Western Union Telegraph office had gone to the war, and Edison took his place. His next engagement was at Stratford, Canada, as night operator on the Grand Trunk Railway. He lost this position by failing to deliver a train order. Edison's next employment was at Fort Wayne, Ind., where he remained but a brief period, going to Indianapolis. The first position he accepted as report operator was at this point. The all-absorbing question was how he could insure success in working the report wire, and at last he hit upon a scheme which was, to say the least, ingenious. In those days, there could be found in every telegraph office old tape recorders. One of these was put in circuit on the report wire, and another of the same instruments alongside of it. The tape, after passing through the first machine and recording the indentations made by the lever point was run through the second instrument, the result being that the first recorder would receive its impression at the rate of forty words a minute, but by feeding the tape more slowly into the second machine, the speed could be reduced to a point where he could make his copy with accuracy and safety. This scheme worked satisfactorily until one night he got so far behind that the paper made a complaint about receiving the report so late, and Mr. Edison was discharged.

From Indianapolis, Edison went to Cincinnati, where he was employed as day operator at sixty dollars per month, but his salary was soon increased to double that amount on account of excellent work performed. In 1864, Edison removed to Memphis, Tenn., hoping to improve his condition. The telegraphers were under military control and received $125 per month and rations. His habits were still those of the student, and his investigations and experiments ceaseless. Most of his misfortunes came as the direct result of his experiments. The manager of the office was at work on a repeater which he hoped soon to perfect; Edison started in with the same object in view, and was first to succeed. He brought his instrument to the office one evening, and for the first time in the history of telegraphy, New York and New Orleans were placed in direct communication with each other. A description of Edison's instrument was published, and the manager, instigated by jealousy, dismissed him. Edison found himself destitute of resources and in debt. His desire was to reach Louisville. He had to walk over one hundred miles of the distance to reach that point. When he arrived at Louisville, the streets were covered with ice. The soles were worn off his shoes, his clothing was of the lightest kind, a linen duster did service for a coat, and a straw hat covered his head, his pockets were empty, and all his worldly effects were in a handkerchief. At the telegraph office he found employment, and for two years he remained in the company's service at this point. His bedroom was his laboratory. Unfortunately, one day, he upset a bottle of sulphuric acid on the floor of the telegraph office, which leaked through to the manager's office on the floor below, for which he was discharged.

About this time he became smitten, like many others of his class, with the South American fever. It was rumored that operators were in demand in Brazil. In company with two companions he started for New Orleans with the intention of embarking at that point. But on arriving they found that the vessel they proposed sailing in had left. While waiting for another boat, Edison came in contact with a Spaniard, who told him there was no country he had seen, and he had been almost everywhere, equal to America. This opinion decided Edison upon remaining in his native land, and he turned his steps toward Cincinnati, where he remained for a year and a half, working on "night report." Tiring of work in the Cincinnati office, he returned to his home in Port Huron. He wrote to a friend in Boston for employment, and while awaiting a response, he hung about the office of the Grand Trunk Railway Company. This company had a wire which ran from Detroit to Port Huron, and thence by cable beneath the river to Sarnia. Another wire ran from Toronto

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to Sarnia, and the authorities desired to continue the latter to Port Huron without laying a second cable. Edison solved the problem, using the same cable for both circuits, and just at this time his friend in Boston had found employment for him. He obtained a pass to that city as a reward for his work. He entered Boston in about the same condition as a few years previously he had entered Louisville.

The telegraphers in the East were more fashionable in their dress than their Western brethren, and Edison's appearance when he entered the operating room was the cause of much merriment. Of course, the first thing thought of was how to take the "conceit" out of this new man, who had the audacity to announce that he was capable of taking report from the fastest operators in the country. In the New York office, an operator named Hutchinson, who was conceded to be the most rapid sender in the service at this time, was duly informed that there was a green young man at the Boston end, whom the boys wished to have some fun with, and they requested Mr. Hutchinson to "let it come" in his best style. Edison's years of work upon report wires had made him very skillful, in addition to which he had experimented with the object of discovering the best style of penmanship for operators' purposes. He had settled upon a slight back hand with regular round letters, and by this mode was able to produce sixty-five words a minute, a rate fully one-third faster than was necessary. Indicating his readiness to begin, the instrument before him commenced to click. Faster and faster it came, but Edison's ear never failed him. The operators who stood about gazed in wonderment, and the New York man began to abbreviate his words. Finally, when he thought the joke had been carried far enough, Edison opened his key and quietly inquired: "Won't you please send with the other foot?" No more pranks of that kind were played on Edison, who was placed regularly at work on the wire between Boston and New York.

It was during his engagement in Boston that Edison took out his first patent, which was for a chemical vote-recording apparatus, designed for legislative bodies. It was also at this period that Edison commenced work on duplex telegraphy. His engagement at Boston terminated and he went to New York. His finances, always low, were now lower than ever, and he found himself two or three hundred dollars in debt, and in want of a situation.

From a central office near Wall street, was operated the Law Gold Indicator System, and the same office was headquarters for the Telegraphers' Journal. These indicators were distributed in about six hundred brokers' offices, to show the fluctuations in the price of gold. When anything occurred to interrupt the service, each broker immediately dispatched a boy post-haste to the main office, and on such an occasion there appeared within one minute not five hundred boys, nor five hundred and ninety-nine, but the full complement of six hundred. It was upon such an occasion as this that Edison one day happened to be in Mr. Law's office. An accident had occurred to the transmitting machinery and the whole indicator system had ceased to work. Gold was high, but the excitement caused by this disaster was higher. Within a few seconds the stream of boys commenced to pour in and transform the office into a perfect Bedlam. Mr. Law, a nervous man, was wildly appealing to his superintendent, Mr. Frank Pope, to do something, while Mr. Pope's nervous system, as badly shattered as that of his employer, rendered him just as incapable of doing anything. In the midst of this confusion, Edison walked quietly over, examined the apparatus, and, turning to Mr. Law, said: "I think, Mr. Law, I can show you where the trouble is. There is a contact spring which has broken and fallen between two cog wheels and prevents the gear from moving." This removed, everything commenced to work again regularly and the office was cleared. The manager asked Edison his name, and the episode resulted in the latter being engaged as superintendent at a salary of two hundred dollars per month.

From this time on he commenced to succeed. He invented a stock printer, which is in use today; then a gold printer, followed by his automatic telegraph system. Then came his quadruplex and his inventions in his acoustic telegraphs and telephones, electric railways and many others of lesser importance. In 1878, he invented the phonograph, which is probably more widely known than any of his other work. His name is indelibly connected with electric lighting, the advances which have been made in that art being largely due to his indefatigable labor and exhaustless genius. So prolific is his brain of inventions that the commissioner of the United States Patent Office has described him as the "young man who has kept the path to the Patent Office hot with his footsteps." He has taken out over four hundred patents and has built up some of the largest and most successful manufacturing institutions in the country. His laboratory at Orange, N. J., is the only one of its kind in the world, and is a marvel in its variety and completeness of equipment.

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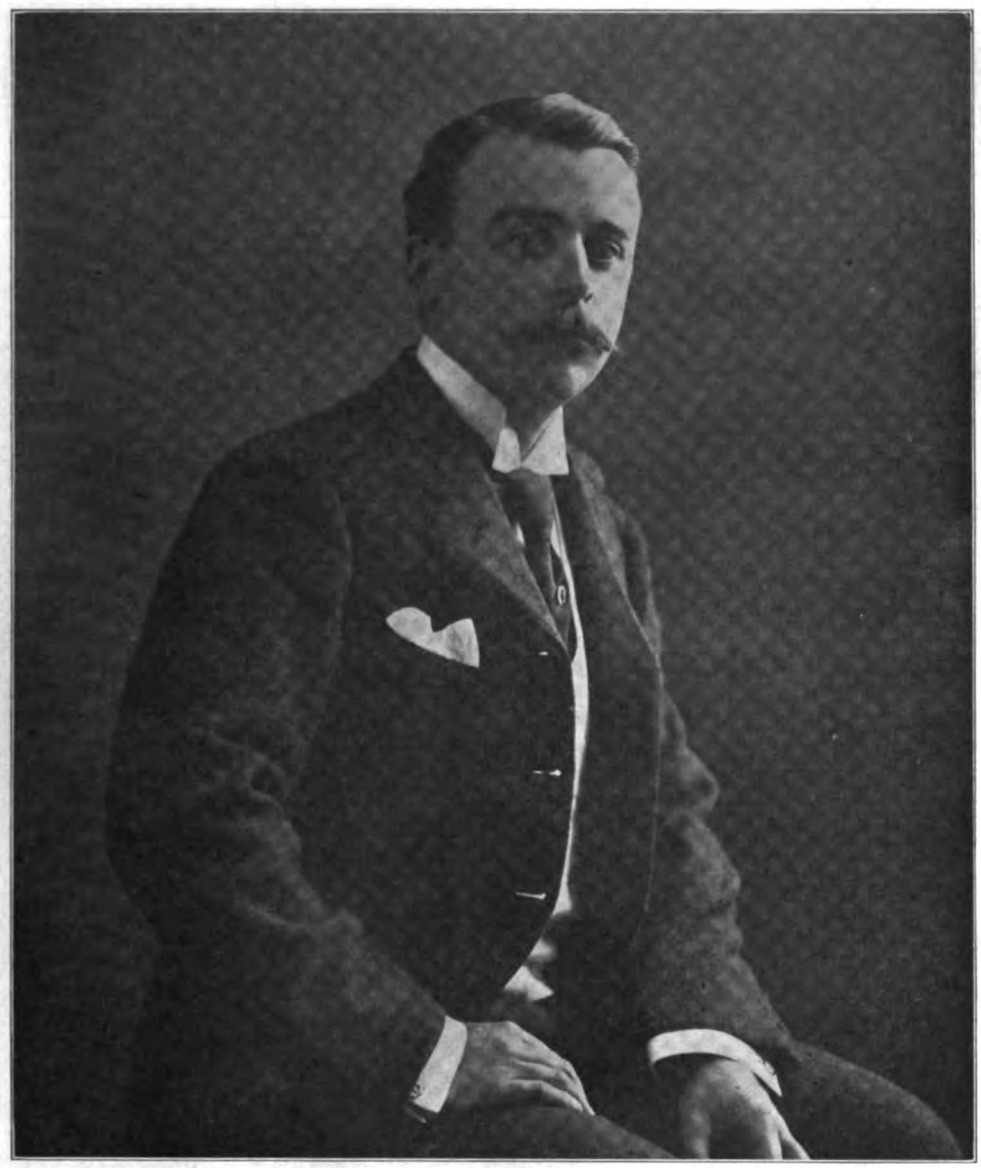

CLARENCE H. MACKAY.

President Commercial Cable Company and Postal Telegraph-Cable Company, New York.

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GEORGE GRAY WARD.

Vice-President and General Manager, Commercial Cable Company, New York.

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The Commercial Cable Company.

The Commercial Cable Company has just completed twenty-three years of active existence. In that time its submarine telegraph system has grown enormously in mileage so that at the present time it owns and operates 26,739 nautical miles of cable, as against 6,084 nautical miles in 1884.

The following table furnishes a striking example of progress and affords an interesting study in the development of American submarine telegraphy.

Year.	Cable Laid Between	Nautical Miles.
	ATLANTIC SYSTEM.	
1884	Waterville, Ireland, and Canso, N. S.	2,384
1884	Waterville, Ireland, and Canso, N. S.	2,348
1884	Canso, N. S., and New York	840
1884	Canso, N. S., and Rockport, Mass., twin core	512
1885	Waterville, Ireland, and Havre, France	510
1885	Waterville, Ireland, and Weston, England, twin core	328
1894	Waterville, Ireland, and Canso, N. S.	2,161
1900	Canso, N. S., and New York	895
1900	Canso, N. S., and Azores Islands	1,698
1901	Azores Islands and Waterville, Ireland	1,205
1901	Waterville and Weston, England	327
1905	Waterville and Canso, N. S.	2,238
1907	New York and Havana, Cuba	1,285
	PACIFIC SYSTEM.	
1902	San Francisco and Honolulu, H. I.	2,276
1903	Honolulu to Midway Islands	1,332
1903	Midway Islands to Guam	2,606
1903	Guam to Manila	1,631
1906	Manila to Shanghai	1,264
1906	Guam to Bonin (Japan)	899
		26,739

The organization of the Commercial Cable Company, now developed to such proportions, with lines reaching over two-thirds of the distance around the globe, was effected in 1883 by the late John W. Mackay, father of Clarence H. Mackay, now president of the company, and James Gordon Bennett, proprietor of the New York Herald, the impelling cause being to create healthy independent competition at reasonable rates, all the other Atlantic companies at that time being affiliated by pooling arrangements.

To the united efforts of both these gentlemen the Commercial project was carried forward to a successful completion and an active competition was thereby brought into the transatlantic cable business. This company has since exerted a marked influence in maintaining equitable tariff rates and in determining a standard of service in every way of a superior character.

In these later days of low rates which has made possible the mighty volume of business handled, it almost taxes credulity to learn that in 1866, the first year of the successful development of the submarine cable, the Atlantic tariff was as high as $100 for twenty words. By 1870 the rate had dropped to $15 for ten words, and at the time the Commercial enterprise was launched the charge was fifty cents a word, a rate that the Commercial immediately reduced to forty cents, and later still further lowered to twenty-five cents a word, the last reduction accomplished, however, only after a long and expensive struggle against the united efforts of the other Atlantic companies to drive it out of business.

With the contemporaneous laying of its first two transatlantic cables in 1884, from Canso, N. S., to Waterville, Ireland, with connecting links on the American side from Canso to New York and from Canso to Rockport, Massachusetts, this company firmly established itself as a factor among the submarine cable companies, until now it may rightfully lay claim to the title of "the leading Atlantic cable company." Its subsequent steady and widespreading growth is instructively reflected in the table appearing herewith.

In 1890 the Commercial Cable Company established at Halifax, a close and valuable connection with the Halifax and Bermudas Cable Company upon the completion of that company's cable between Halifax and Bermuda, which was further augmented in 1897, when the Direct West India Cable Company extended this line from Bermuda to Jamaica, touching en route at Turks Island.

It was not many years before the Commercial company's two transatlantic cables were found insufficient to accommodate the increased business resulting from the uniform satisfaction afforded to its patrons, and in 1893 a third cable was determined upon, which was successfully completed in July, 1894.

Six years later witnessed the laying of a fourth cable (completed in 1901), also having for its objective points Canso, Nova Scotia, and Waterville, Ireland, but following a divergent course; namely, by way of the Azores. This intermediate stopping point was selected in order to effect a juncture with the cable of the Europe and Azores Cable Company at the Azores to provide a shorter and quicker means of communication with Portugal, Southwestern Europe, Egypt, Africa, India, the Far East, as well as with South America.

This same year also marked the laying of the first direct cable from Germany to the United States (Borkum, near Emden, and New York City), touching at the Azores en route. Although this cable is owned by a foreign corporation, it is closely allied with the Commercial Cable Company, from whose office in New York the cable is worked.

The progressive policy of the company had long since been apparent and the improved facilities it afforded to the commercial world were of great importance, and recognized by increased patronage. While its growth up to that time was noteworthy, indicating the sound and far-seeing judgment on the part of those who were directing its energies, and which had secured important connections which opened up broader systems of communication, the limit of development had not yet been reached, for other projects of extension, greater than any heretofore carried out, were being planned, the complete realization of which followed in close sequential order.

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A Pacific cable to connect the United States with its Pacific possessions, which for many years had been contemplated, was at this time again being earnestly discussed, in Congress, by the press, and by others interested. For political reasons the government recognized acutely the necessity for such a cable. By some government ownership of such a line was advocated; by others that it should be built under a government subsidy. At this conjuncture, John W. Mackay, a man decisive of character, clear of perception and whose business intuitions were rarely at fault, came forward and offered to lay the cable without any guarantee or subsidy whatever from the government. His position in the business world, the vast wealth and experience he had acquired as head of a large and successful cable company, at once inspired confidence in his proposition, and on every side it was admitted that he of all men was the one best qualified to undertake this much needed enterprise.

When it is considered that comparatively little was known of the contour and nature of the bottom of the Pacific ocean, with its tremendous depths, from some parts of which a cable could never be lifted again to effect repairs, the hesitation up to this time to risk capital in such a project, involving millions of dollars, is not at all surprising.

The necessary concessions having been obtained, the Commercial Pacific Cable Company was organized, and on November 19, 1901, the announcement was made that the contract had been let for the construction of the cable. The first section between San Francisco and Honolulu was completed on January 1, 1903. On July 4, 1903, a most fitting date to patriotic natures, the remaining portion of the Pacific cable was successfully laid, and messages were exchanged between San Francisco and Manila, the intermediate stations being Honolulu, the Midway Islands and Guam.

The successful outcome of this immense undertaking won the applause of the nation, the appreciation of the world, and very naturally gave to the Commercial interests a tremendous impetus. Their allied systems were becoming world-wide in extent, the Atlantic and Pacific oceans were spanned, and a special wire stretched from ocean to ocean (New York City to San Francisco) to connect its Atlantic with its Pacific systems.

Unfortunately, John W. Mackay did not live to see the consummation of this cherished Pacific cable scheme, in the early promotion of which he had shown so much zeal and enthusiasm, for he died on July 20, 1902. The mantle of the father fell to the son, and Clarence H. Mackay has proved to be a worthy successor to a worthy sire.

Following out the chronological order of these quickly succeeding cable expansions, omission should not be made to note the completion on June 1, 1904, of a second German cable, which is also operated in New York City by the Commercial Cable Company.

In 1905 the Newfoundland government arranged with the Commercial Cable Company to lay for it a cable from the company's station at Canso, N. S., to Port aux Basque, Newfoundland, thus establishing direct communication with that island, which for many years the company was unable to do on account of exclusive rights enjoyed by an English company. The crowning act of that year's work, however, was the successful completion of a fifth Atlantic cable. The large core of this cable makes it capable of transmitting messages at a very high speed.

The events of the year 1906 record the laying of two very important extensions to the Pacific cable; namely, the cable between Manila and Shanghai, and a cable between Guam (Ladrone Islands) and Bonin, where it joins the Japanese cable to Tokio. Both these extensions are of great strategical and commercial value.

The announcement still fresh in our minds of the laying of a cable from New York to Havana by the Commercial Cable Company of Cuba marks the culmination of a project to introduce competition into a field where for many years exclusive concessions made this impossible.

During the year 1907, just closed, the aerial lines which were formerly used for the transmission of messages between the cable termini at Bristol and London, were replaced by underground wires to safeguard the continuity of telegraph service against the possible and probable interruption from storms and other elements of danger to which overhead wires are continually exposed.

The creation of this vast cable enterprise so far-reaching in its influence and conferring benefits so varied, while of course a business venture, has also been actuated by strong patriotic motives, a fact which should not be lost sight of in all present and future estimates of its projector and of his completed work, and of the exceptionally able staff who so loyally have lent their aid.

Mr. Mackay's chief lieutenant and adviser in all of his cable undertakings has been George Gray Ward, vice-president and general manager of the Commercial Cable Company. Not only at the first, but continued down through all the years of its existence, Mr. Ward has filled this official position, supported by the full confidence and financial backing of Mr. Mackay, and since his death by that of his son and successor, and it is largely to Mr. Ward's knowledge, skill, fine executive ability and the aggressive policy he has pursued, that the Commercial Cable Company has reached its present status.

What the future has in store for this company and its allied lines may not, perhaps, be definitely outlined at this time, but it cannot be doubted that the governing ideas of progress that have thus far directed its life and growth and placed it in the van of cable enterprises, will still continue to dictate its policies.

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The financing of the dual companies, Commercial Cable and Commercial Pacific Cable, as well as the associated Postal Telegraph-Cable Company, the land line portion of the combined systems, has called for the exercise of wise knowledge and careful methods. It is now vested in what is known as The Mackay Companies, organized early in 1904, to afford a better form of strengthening and safeguarding the stockholders of the Mackay interests, paramount in the several telegraph companies. Capitalized at $100,000,000, it offers a bulwark of security to the investments for which it stands.

The executive members of the staff of Commercial cable interests the world over are as follows:

Clarence H. Mackay, president; George Gray Ward, vice-president and general manager; Albert B. Chandler, vice-president; Charles R. Hosmer, of Montreal, vice-president; E. C. Platt, treasurer; E. C. Merritt, assistant treasurer; Albert Beck, secretary; J. O. Stevens, assistant secretary; George Clapperton, traffic manager; S. S. Dickenson, general superintendent; S. F. Austin, assistant superintendent, all of New York, excepting Mr. Hosmer; Frederick Ward, manager in England; Robert Herne, superintendent, Rockport, Mass.; F. H. Putt, superintendent, Boston; F. B. Gerrard, superintendent, Canso, N. S.; F. Chevallier, superintendent, Fayal, Azores Islands; R. J. Hughes, superintendent, Waterville, Ireland; E. G. Phillips, superintendent, London; J. Furze, superintendent, Liverpool, and Robert Budden, superintendent, Manchester, all of England; H. J. Tracey, superintendent, Glasgow, Scotland; Emile Ronot, superintendent, Havre, and Leon Crozat, superintendent of agencies, Paris, France; Charles Priest, electrician, New York; John Gott, consulting engineer, London; F. H. Dennis, superintendent Clearing House, New York; John Lawson, superintendent, Havana, Cuba; Patrick McKenna, superintendent, San Francisco; John D. Gaines, superintendent, Honolulu; Ben W. Colley, superintendent, Midway; H. F. Harrington, superintendent, Guam; E. Desnouee, superintendent, Manila; Daniel Coath, superintendent, Shanghai; Basil Combe, commander cable steamer Restorer, Honolulu, and W. F. Linton, acting commander cable steamer Mackay Bennett, Halifax.

Clarence H. Mackay.

Clarence H. Mackay, New York, president of the Commercial Cable Company and of the other great allied Commercial cable enterprises, as well as of the Postal Telegraph-Cable Company, all of which are included within the interests controlled by The Mackay Companies, corporation, is the only living son of the late John W. Mackay, and succeeded to the control of the vast telegraph properties of his father on October 4, 1902, following the death of the latter which occurred on the previous July 20. Mr. Mackay was born in San Francisco, Cal., April 17, 1874. Since he assumed the direction of these trusts, although a burden of heavy responsibility for so young a man, he has nevertheless displayed consummate skill in their management and in conducting their extension.

George Gray Ward.

George Gray Ward, vice-president and general manager of the Commercial Cable Company, has proved himself to be a genius in cable management. He was born at Great Hadham, Hertfordshire, England, December 30, 1844, and was educated at a private school at Cambridge. Mr. Ward developed while at school at the early age of ten, a taste for telegraphy and received a prize for his knowledge of the art. On leaving school he entered the employ of the Electric Telegraph Company, and after passing through the various grades of the service at different stations, resigned in 1865, and joined the Egyptian government telegraph service, and for about three years was stationed at Alexandria, Egypt.

Mr. Ward was one of the few who stuck to his post during the cholera epidemic of 1865, and his valuable services rendered to the government at that period, were especially acknowledged by Ismael Pacha, the then viceroy. Realizing that the prospects for advancement were not very promising in that service, he resigned and accepted a position with the first French Atlantic Cable Company (1869), and was selected to accompany the steamship Great Eastern as a member of the electrical staff on board that ship during the laying of the cable. Mr. Ward was stationed at St. Pierre, Miquelon, and remained there five years. In 1874, owing to ill health, he resigned his position and returned to England. He afterward joined the Direct United States Cable Company, as superintendent, and organized that company's system in the United States, making his headquarters in New York. Previous to the advent of the Direct Cable it was considered a great feat to receive an answer to a cablegram from London inside of thirty or forty minutes. Mr. Ward so improved the service as to materially reduce this time. He succeeded in making the Direct Cable Company very popular, not only with the public but with the press. In 1884 he accepted the post of secretary and general manager of the Commercial Cable Company. In 1890 he was relieved of the position of secretary and elected vice-president of the company, and in this position those qualities of sound generalship which have characterized Mr. Ward's connection with the Commercial have enabled him to achieve great successes in the interests of the cabling public, by perfecting an up-to-date unique transatlantic service, while his urbanity, consistent impartiality and tact in the administration of the company's internal affairs, have merited the confidence and affection of the many members of the company's staff. Mr. Ward's skill and diplomacy have more

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than once brought delicate and important negotiations entrusted to him to a successful issue. His relations with the officials of the telegraph companies of America and Europe, whether opposed to his company or not, have always been most pleasant. The great services contributed by Mr. Ward in jointly promoting with the Messrs. Mackay, father and son, the important enterprise of the Commercial Pacific cable, viewed not only as a "commercial" undertaking, but in its international value as a possible factor of political significance, is still fresh in the public mind. Its history has appeared in these columns at a comparatively recent date, and requires no further specific mention at this time. Nor is it necessary to refer to the recent accomplishment of the laying of the Cuban cable. Mr. Ward's name and fame as a great cable executive is secure.

Mr. Ward is a vice-president, director and member of the executive committee of the Postal Telegraph-Cable Company, and a member of the New York Chamber of Commerce. He is also a member of the American Institute of Electrical Engineers and many other organizations.

For services rendered the German Emperor conferred upon Mr. Ward the "Order of the Royal Crown of Prussia"; the Emperor of Japan, the "Order of the Rising Sun."

Frank B. Gerrard, Superintendent, Commercial Cable Company, Canso, N. S.

The largest cable station in the world is that of the Commercial Cable Company located at Hazel Hill, Canso, N. S. Nine cables find a landing at this point. The superintendent in charge of this important post is Frank B. Gerrard.

Mr. Gerrard was born at Buckie, Barff, Scotland, July 17, 1854, and received his early telegraph training in the British government telegraph service. He entered the employ of the Direct United States Cable Company in 1874, and was appointed to the cable station of that company at Torbay, Nova Scotia. Here he served for a number of years, a period in which he worked hard, studied much and laid the foundations of that knowledge which has stood him so well in later years. In 1881 he was called to be the assistant superintendent of the Western Union cable station at Canso, a position he continued to fill until 1890, afterward serving the French Telegraph-Cable Company at St. Pierre, Miquelon. From this latter position he retired in May, 1894, to accept the place of assistant superintendent of the Commercial Cable Company's station at Canso. Here he served for ten years under the superintendency of Samuel S. Dickenson, now at New York. During this decade, Mr. Gerrard demonstrated his ability as an all-around cable expert, and his promotion to the superintendency was a logical advancement from every point of view. He is a clever technical student, an able administrator, and the business of the station moves satisfactorily forward under his care.

H. A. Tuttle, Vice-President and General Manager, North American Telegraph Company, Minneapolis.

Henry A. Tuttle, vice-president and general manager of the North American Telegraph Company, Minneapolis, Minn., was born in Oswego, N. Y., September 19, 1846. He entered the telegraph service in 1863, on what was known as the United States Branch Telegraph Company, running from Syracuse to Ogdensburg, N. Y. His first office was at Adams, N. Y. He then went to Ilion, N. Y., for the United States Telegraph Company,

HENRY A. TUTTLE.
Vice-President and General Manager North American Telegraph Company, Minneapolis, Minn.

and at the time of the consolidation he was retained as the manager of the Western Union telegraph office at that point. In 1866 he again went to Oswego, N. Y., and in 1870, succeeded John Fuller, as manager of that office, where he remained until 1876, when he practically retired from the business. In 1881, he returned to telegraphy, as operator, in St. Louis, Mo., and in February, 1882, accepted the managership of the Western Union telegraph office, at Minneapolis, Minn., remaining there four years, when he resigned to construct the North American Telegraph Company's lines, with which system he has since been identified as general manager. Mr. Tuttle, who is well and favorably known throughout the entire country, possesses executive ability in large degree, and the success of his company is due entirely to his untiring efforts.

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E. J. Nally, First Vice-President and General Manager, Postal Telegraph-Cable Company.

The election of Edward J. Nally, first vice-president and general manager of the Postal Telegraph-Cable Company, has placed in that responsible position one of the ablest individual forces of the system with which he has so long been associated, a post for which he is eminently fitted, both by long training and judicial temperament.

Mr. Nally is a native of Philadelphia, where he was born April 11, 1859. Like many another who has risen to the higher plane of his calling, he, too, commenced life as a messenger. This was with the Western Union Telegraph Company at St. Louis, September 1, 1875. As a lad he was

EDWARD J. NALLY.
Vice-President and General Manager, Postal Telegraph-Cable Company, New York.

faithful to employing interests, and early evinced traits of character, showing capability and manliness, since developed with advancing maturity, that early gained for him recognition and promotion. In 1878 he was made a clerk in the office of Col. Robert C. Clowry, now president of the Western Union Telegraph Company, and who at that time was assistant superintendent at St. Louis. Later he followed Mr. I. McMichael, now vice-president and general manager of the Great North Western Telegraph Company, at Toronto, Ont., to Minneapolis, where he had been appointed superintendent in charge of the lines formerly the property of the North Western Telegraph Company, and from whom he derived a valuable training. Here he was appointed chief clerk to Mr. McMichael in 1885, a position he retained until October 20, 1890, when he resigned to become assistant to the general superintendent at Chicago of the Postal Telegraph-Cable Company, his appointment as assistant general superintendent coming January 1, 1892. He was made general superintendent, January 1, 1901. On October 1, 1906, he was created a vice-president, director and member of the executive committee of the company, and removed to New York, where, on April 11, 1907, his birthday, he was further promoted to the general managership, which placed him at the executive head of the great corporation with which he had so long been identified.

Mr. Adams, Vice-President Postal Telegraph-Cable Company.

Charles C. Adams, second vice-president of the Postal Telegraph-Cable Company, affords in his career one of the best examples of the rise and

CHARLES C. ADAMS.
Second Vice-President, Postal Telegraph-Cable Company, New York.

progress of the American telegrapher. He illustrates in his person the possibilities of attaining individual success in life, which in varying degree is placed within the reach of every human being. Without external influences or aids of any kind; none other than those developed in qualities of mind born of strong purpose, of determination to succeed in which moral sense formed a fitting background, elements of character that act always as propelling forces, especially when, as in this case, coupled happily with bodily health, Mr. Adams has reached high position, coming up the ladder of promotion from its lowest round. He was born at Freeport, Pa.,

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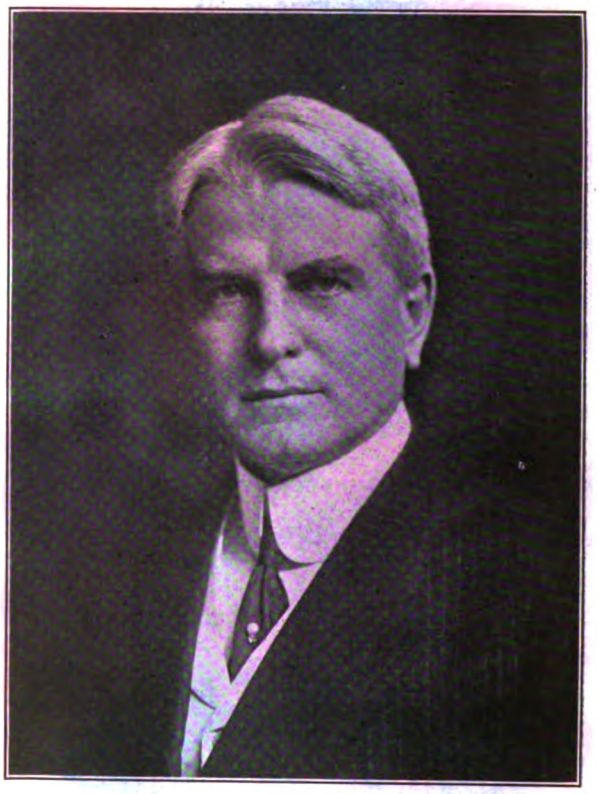
August 13, 1858, his early education being acquired in the public schools of Pittsburg and at the Academy at Sharpsburg. He was fifteen years old when he left the latter institution, and began the study of telegraphy. A knowledge of the latter acquired, he entered the telegraphic field and for several years found employment in the oil regions of western Pennsylvania in the service of the Atlantic and Pacific and Western Union telegraph companies, and in 1879 as an operator for the latter at Pittsburg. In 1880 he was employed by The Associated Press at Fort Wayne, Ind., leaving the following year to accept an appointment with the Western Union Telegraph Company at New York. Here the personal bearing, the marked executive abilities, his expert qualities as an operator, attracted the attention of the Mutual Union Telegraph Company, and his appointment as manager of its Pittsburg office followed. This was in November, 1881, and for two years he filled this position until the company was merged with that of the Western Union in 1883, when he entered the newspaper service, subsequently returning to New York. In February, 1884, when twenty-five years of age, he was appointed manager of the Postal Telegraph Company at Philadelphia, beginning a service in which he has since remained and in which he has attained distinction. He quickly grasped the possibilities of success for his company, then a new organization, that lay within his reach, and worked hard to advance its interests. He displayed such a degree of energy, of resourcefulness, of executive ability, as to win commendation and which led to his promotion after an eventful two years of service, to the position of superintendent. In the larger sphere in which he was now placed, he was correspondingly successful, so that his appointment as general superintendent of the southern division with headquarters at Atlanta, Ga., followed as a sort of natural sequence. Excellent results attended him at this point, from which on February 16, 1904, he came to New York and was appointed to a vice-presidency of the company.

Charles P. Bruch, Third Vice-President of the Postal Telegraph-Cable Company.

Charles P. Bruch, third vice-president of the Postal Telegraph-Cable Company, has been identified with that company for over sixteen years, having entered that service as assistant to the vice-president in June, 1891. Mr. Bruch was born in Louisville, Ky. His father, Capt. Samuel Bruch, was in charge of the military division of the Mississippi, United States government telegraphs, and was also general manager of the Southwestern Telegraph Company. After his father's death Mr. Bruch, with his mother's family, lived, until he was eighteen years old, in Canton, Ohio, where he learned to telegraph, and was employed as an operator in the Western Union office for several months, when he came to New York.

After working in the Western Union main office in New York as an operator and in other capacities for four years, he left that service to take the secretaryship of the Telegraphers' Mutual Benefit Association. At the conclusion of his fifth year in this position, Mr. Bruch resigned and took charge of the office of the Edison Phonograph Company, under its general agent, the late Mr. E. T. Gilliland, until that company was absorbed by the North American Phonograph Company. He then became the secretary and treasurer of the Non-magnetic Watch Company, remaining in that capacity for several years, when he re-entered the telegraph service, in the employ of the Postal Telegraph Company.

Mr. Bruch has always been actively interested



CHARLES P. BRUCH.
Third Vice-President, Postal Telegraph-Cable Company, New York.

in various telegraph societies, having been one of the organizers and a director for several years of the Serial Building Loan and Savings Institution; the first president of the Magnetic Club; a member of the executive committee of the New York Telegraphers' Aid Society, and for several terms as president of the Gold and Stock Life Insurance Association. He has been a vice-president of the Telegraphers' Mutual Benefit Association for the past ten years.

He also has been actively associated with various social organizations not connected with the telegraph, among them being the Ohio Society of New York, the Indian Harbor Yacht Club, of which he was a charter member and at one time secretary, and the Canton Society of New York, of which he was president for two years.

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Isaac Smith, Superintendent of Tariffs, Postal Telegraph-Cable Company.

Isaac Smith, superintendent of tariffs, of the

ISAAC SMITH.
Superintendent of Tariffs, Postal Telegraph-Cable Company, New York.

Postal Telegraph-Cable Company, was born in Brooklyn, N. Y., May 10, 1859. He entered the telegraph service in 1880, with the American Rapid Telegraph Company and later with the Bankers' and Merchants' Telegraph Company. He entered the employ of the Postal Telegraph-Cable Company in 1884, being connected with the auditor's and tariff departments until December, 1892, at which time he was appointed superintendent of tariffs of same company, which position he still holds.

Mr. Smith resides in New Jersey, where he has been honored in his home town by being elected a justice of the peace, a member of the board of education, and other municipal bodies.

Edward Reynolds, Auditor of the Postal Telegraph-Cable Company.

Edward Reynolds, the auditor of the Postal

EDWARD REYNOLDS.
Auditor, Postal Telegraph-Cable Company, New York.

Telegraph-Cable Company, is also a director in that corporation. Mr. Reynolds was born at Catskill, N. Y., November 11, 1866. At eighteen years of age he began his telegraphic career. Coming to New York in 1889, his service with the Postal company began on August 1 of that year as an operator in that section of the city known as the "dry goods district." His faithfulness, intelligence and capacity met with early acknowledgment, and on April 1, 1891, he became chief clerk to Superintendent Cochrane. On February 1, 1897, he was appointed to a like position in the office of the general superintendent, thence on July 1 was promoted to the chief clerkship in the office of Vice-President Bradley. On January 1, 1900, he was advanced to the position of assistant auditor, and on May 1 of the same year to that of auditor.

W. D. Francis, Superintendent of Supplies, Postal Telegraph-Cable Company.

Walter De Mund Francis, superintendent of supplies of the Postal Telegraph-Cable Company, was

WALTER D. FRANCIS.
Superintendent of Supplies, Postal Telegraph-Cable Company, New York.

born at Bath, Long Island, August 26, 1862. In February, 1879, he entered the service of the Gold and Stock Telegraph Company as messenger and clerk in the office of the purchasing agent, George B. Scott. He was subsequently engaged by the Union Electric Manufacturing Company, in whose service he spent about two years, being associated there with Ralph W. Pope and Francis W. Jones, late electrical engineer of the Postal Telegraph-Cable Company. In 1884 he was employed by the late Russell H. Robbins, then superintendent of supplies and purchasing agent of the Bankers' and Merchants' Telegraph Company, and during the entire period of Mr. Robbins' connection with the Bankers' and Merchants', United Lines and Postal companies, Mr. Francis was his assistant. During the construction of the Pacific Postal lines Mr. Francis was temporarily transferred to San Francisco and rendered efficient and valuable service in receiving and distributing materials, supplies and cash in connection with construction

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work on that coast. Naturally of quick perception, he has by his untiring energy acquired a detailed knowledge of accounts and of everything pertaining to telegraph materials and supplies. His reputation among the business concerns with whom he comes in contact is an enviable one. Capacity for work and extreme industry are perhaps his chief characteristics, but his knowledge of details, coupled with a remarkable memory, enable him to perform his work with rare accuracy and efficiency and to command the respect of everyone who knows him.

Minor M. Davis, Electrical Engineer, Postal Telegraph-Cable Company, New York.

Minor M. Davis, electrical engineer, Postal

MINOR M. DAVIS.
Electrical Engineer, Postal Telegraph-Cable Company, New York.

Telegraph-Cable Company, New York, was born in North Chatham, Massachusetts, and he is not yet quite fifty years of age. He began his telegraph work as a messenger and became an operator, spending several years as branch office manager and in working at the key in Washington, D. C., Philadelphia, Baltimore and New York. Qualifying himself by study for the duties of a chief operator, he served as wire chief and traffic chief until he was transferred to the electrical engineer's department of the Postal company. During the past ten years Mr. Davis has been traffic manager and assistant electrical engineer of the company he is now serving. In June, 1907, he became electrical engineer of the company.

J. F. Skirrow, Associate Electrical Engineer, Postal Telegraph-Cable Company.

John F. Skirrow, associate electrical engineer of the Postal Telegraph-Cable Company, New York, was born at Blackburn, England, February 19, 1869, and was educated at private schools in that country. At an early age he became a teacher in the public schools of his native country. He came to the United States in May, 1885, and became an apprentice in an engineering firm in Hartford, Conn., the following year finding employment in New York with the Lidgerwood Engineering Company. Studying telegraphy, with which he became infatuated, he left his position, where he was engaged as a tool maker, to manage a commission office for the Postal Telegraph-Cable Company, in Brooklyn. Soon afterward he entered the Western Union Telegraph Company's service, working in Brooklyn, at 195 Broadway, New York, at Jacksonville, Fla., at Asbury Park and Atlantic City, N. J., and other places, until October, 1890, when he re-entered the service of the Postal company as chief operator at Savannah, Ga. On account of the failing health of members of his family, it became necessary to return North, and November of 1891 saw him a member of the extra list at the Postal office, New York.

In the course of a few months he was transferred to the regular force, and in October, 1892, was appointed quadruplex chief at 187 Broadway. He was temporarily attached to the electrical engineer's staff during the planning and installation of the Postal's new office at 253 Broadway, ren-

J. F. SKIRROW.
Associate Electrical Engineer, Postal Telegraph-Cable Company, New York.

dering valuable service in this connection. He served in the capacity of quadruplex chief and office electrician until June 12, 1895, when he was appointed assistant manager of the general operating department at New York. This position he held for seven years, until June 1, 1902, when he was promoted to the newly created position of electrician of the eastern division.

On January 1, 1904, he was promoted to be assistant electrical engineer, and on January 1, 1905, in further recognition of his services, to his present position of associate electrical engineer.

During the past dozen or more years Mr. Skirrow has devoted much attention to the improvement of telegraph apparatus and pneumatic tube systems, and switchboards and apparatus of his design have been adopted by the Postal and its connecting companies as their standards. Several

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of the most modern of the Postal's plants, notably those at Buffalo, N. Y., Baltimore, Md., and Boston, Mass., were planned by and equipped under the supervision of Mr. Skirrow.

A portable telegraph office, comprising engine, dynamos and quadruplexes, which has seen frequent service in telegraph emergencies during past few years, was devised by Mr. Skirrow in 1901. This plant furnished special telegraph facilities at short notice during the great Baltimore fire in 1903, during the Peace Conference at Portsmouth, N. H., in 1905, and on other notable occasions. Mr. Skirrow has also given considerable attention to the systematizing of records, wiring diagrams, etc. The well known book of Official Diagrams of the Postal Telegraph-Cable Company's apparatus was prepared under his immediate supervision.

Mr. Hargrave, Postal Superintendent at Birmingham, Ala.

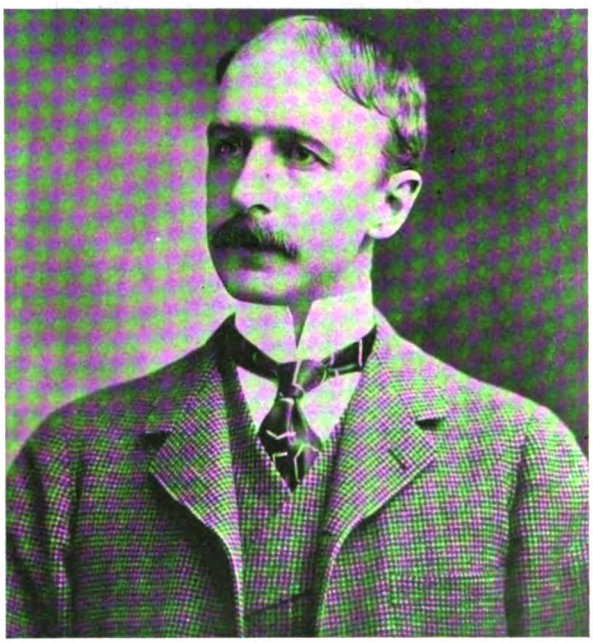
Jesse Hargrave has been appointed superintendent of the Postal Telegraph-Cable Company,

JESSE HARGRAVE.
Superintendent Postal Telegraph-Cable Company, Birmingham, Ala.

at Birmingham, Ala. He was born at Lexington, N. C., February 18, 1865, the place and date of entry into the telegraph service being at Laurel Hill, N. C., in 1884. Here he served as an operator and assistant agent for the Seaboard Air Line Railway. From this beginning he subsequently served as operator for the Chesapeake and Ohio and the Pennsylvania railroads. Leaving the railroad for the commercial service, he became in sequential order an operator for the Western Union Telegraph Company at Augusta, Ga., at Nashville, Tenn., and at Chicago. This covered practically the year 1888, when he accepted an offer to go to Nashville in the employ of The Associated Press. Here he remained for three years, when he entered the Postal employ at New Orleans as an operator. His genuine abilities as an all-around telegrapher gained for him prompt recognition, and he was soon advanced to the position of chief operator. Always a student, with an exceedingly practical bent of mind, Mr. Hargrave made rapid progress in his development as an electrician. He gained a quick grasp of his subject, his insight was keen, and it was natural that promotion should be further tendered him. He went to Atlanta, Ga., there to serve the company for three years as electrician and division assistant electrical engineer. But he outgrew his environment, and when he was called to New York and given the office of assistant electrical engineer it was believed that his further career would be continued in that department. Mr. Hargrave, however, had expanded not only as an electrician, but had also showed marked capacity as an executive force. The recent changes determined upon in the Postal service have again shifted and advanced Mr. Hargrave, and in returning to the southern field, this time as a superintendent, he has had bestowed upon him a reward significant of and in keeping with his advancing reputation.

T. L. Cuyler, Jr., Assistant Treasurer, Postal Telegraph-Cable Company.

Theodore L. Cuyler, Jr., the assistant treasurer of the Postal Telegraph-Cable Company, has been identified with the company from a time shortly after its organization. He was born in Brooklyn, where he now resides, July 9, 1863, and is the son of the well-known clergyman, one



T. L. CUYLER, JR.
Assistant Treasurer, Postal Telegraph-Cable Company, New York.

of the most honored names in the Christian ministry, and whose full name he bears. Mr. Cuyler entered the company's service in 1885, and four years later, in 1889, was elected to the position he has since continued to hold, the duties of which he has discharged with much efficiency. He is a member of the Magnetic Club and of other telegraphic organizations.

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Mr. Capen, Postal General Superintendent at Chicago.

Welcome I. Capen, general superintendent of the western division of the Postal Telegraph-Cable Company, with headquarters at Chicago, succeeded to that position when his predecessor, E. J. Nally, was called to New York to accept the vice-presidency of the company and shortly thereafter to become its general manager. Mr. Capen comes of sturdy New England stock, and possesses the character, the poise and balance of mind that fits him to meet the important executive responsibilities of the office he now holds. Quiet and unassuming in manner, firm in his convictions and with a thorough knowledge of the

W. I. CAPEN.
General Superintendent, Postal Telegraph-Cable Company, Chicago, Ill.

duties incident to the important division over which he presides, he is fulfilling the requirements necessarily demanded of him. Mr. Capen was born at Brattleboro, Vt., July 25, 1854. He has been in the telegraph service all of his business life, his record beginning as a messenger boy at ten years of age in his native place with the Vermont, Boston and Montreal Telegraph Company. Later he became an operator for the same company, afterward entering the employ of the Western Union, and in turn serving many of the old opposition companies, eventually reaching the managership of the Automatic Telegraph Company at Baltimore, retiring therefrom when this company passed under the control of the Atlantic and Pacific. Subsequently he served the Western Union at Cincinnati as wire chief, resigning to accept the managership of the Baltimore and Ohio office in that city. His appointment as manager of the Postal Telegraph-Cable Company at Cincinnati began his connection with that company. His abilities were early recognized and from Cincinnati he went to Indianapolis, there to become a superintendent of his company. His call to the superintendency at Chicago followed, from which his promotion to the office of general superintendent was a natural sequence.

Frank J. Loesch, Lawyer.

Frank J. Loesch is the senior partner of the law firm of Loesch, Scofield and Loesch, of Chicago. During the year ended November 23, 1907, he held the distinguished honorary office of president of the bar association of that city. Mr. Loesch was born at Buffalo, N. Y., on April 9, 1852. He began his business career as a messenger for the Western Union Telegraph Company in his native town in 1866. Of an observant mind, studious habits and paying strict attention to his duties, young Loesch soon attracted the attention of his superiors and was early awarded promotion to the clerical service of the company. In 1870 he was transferred to the Chicago office and appointed error clerk, a position he filled for four years, when he became engaged in night work on the books, error sheets, etc., in which employment he continued until August 1, 1881. During this period Mr. Loesch had applied himself diligently to the study of law. So thorough had been his preparation that he readily passed a rigid examination and received high commendation and entered upon the practice of his profession with a mind well grounded for the life work before him. In 1892 he was selected to be the general attorney for the western division of the

FRANK J. LOESCH.
General Attorney, Postal Telegraph-Cable Company, Chicago, Ill.

Postal Telegraph-Cable Company, an office he still holds. He takes an active interest in all that pertains to the higher welfare of Chicago, and for four years, from 1898 to 1902, was a member of the board of education.

Superintendent L. Lemon at Philadelphia.

L. Lemon, superintendent of the Postal Telegraph-Cable Company, at Philadelphia, affords a fine example of the successful rise of the farmer boy, the best stock from which the business man is evolved. He was born on a farm near Patterson (now Mifflin), Juniata County, Pa., June 9, 1867. In the summer of 1881, when fourteen

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years of age, he entered the telegraph service on the middle division of the Pennsylvania Railroad, that from Harrisburg to Altoona, Pa. From this beginning his subsequent career has been a varied and active one. He early acquired the art of telegraphing, and like everything else Mr. Lemon has since done, this duty he performed well, for he was actuated by a conscientious desire to excel, his aim being to make a success of himself. From an operator in railroad employ the transition to the commercial service was a natural one. At Trenton, N. J., he became a Western Union operator, afterward as manager of the same interests at Mifflin, near his old home. Since that time his alternate occupations as operator and manager, first of one company and then of another, in widely different parts of the country, interspersed by returns to railway telegraphing, were many, steadily gaining in practical experience and rising in responsibility of position occupied. Returning from the West, he became manager for the Postal company at

L. LEMON.
Superintendent Postal Telegraph-Cable Company, Philadelphia, Pa.

Altoona, Pa., from which he was advanced to the charge of the more important office in Baltimore, in which city he also served as superintendent of the fire and police telegraph. His record at Baltimore so far determined the character of the man that his appointment as superintendent, with headquarters at Pittsburg, was a natural sequence. From the latter point to Philadelphia, where he now is, Mr. Lemon has under his direction one of the most important districts of the Postal system.

Benjamin S. Price.

Benjamin S. Price, the superintendent of construction of the southern division, Postal Telegraph-Cable Company at Atlanta, Ga., was born at Bolivar, Pa., July 3, 1858. When twenty years of age he became an operator in the employ of the Western Union Telegraph Company, where he remained until appointed to the position he now holds. Within the field of his present occupation

BENJAMIN S. PRICE.
Superintendent of Construction, Postal Telegraph-Cable Company, Atlanta, Ga.

Mr. Price is doing excellent work, and exhibits in its execution close practical knowledge, and is alert to all requirements.

Mr. Black, Postal Superintendent at Denver.

William Cormack Black is the superintendent of the seventh district, western division, of the Postal Telegraph-Cable Company, Denver, Colo. Mr. Black comes from Michigan, in which state he was born at Detroit, October 5, 1859. When but ten years of age he became an apprentice and messenger attached to the depot of the Michigan Central Railway in that city. When fifteen years old he was given a place in the bookkeep-

W. C. BLACK.
Superintendent Postal Telegraph-Cable Company, Denver, Colo.

er's office and learned how to telegraph, an art acquired at odd moments of leisure. Thus fitted, in 1875 he secured a position as operator for the

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Western Union Telegraph Company, retaining the same until 1884. It was a good school for the young fellow, and he was an observing and faithful student, so much so that in 1884 he was called to be chief operator of the Postal company. For six years he remained in this office, when he was transferred to a like position at Denver, Colo. This was in 1890. Four years later he was promoted to the managership of the office, and in 1895 received the appointment of superintendent which he has since continued to fill. Merit alone has been the governing factor in promoting Mr. Black's success.

Mr. Gingrich, Postal Chief Operator at Harrisburg.

James H. Gingrich, chief operator of the Postal Telegraph-Cable Company at Harrisburg, Pa., at which point he is also agent for Telegraph Age, was born in the Keystone state, at Mexico, November 2, 1860. He was fifteen years old when he first entered the telegraph service, which occurred at Marysville, Pa., in October, 1875, in the employ of the Pennsylvania Railroad. Subsequently he served other railway interests. When going to Harrisburg, at which point he has since remained with a single break, he held positions with the American Rapid Telegraph Company, a brokerage firm, The United Press, manager of the Baltimore and Ohio Telegraph Company office, superintendent and electrician of the East Harrisburg Electric Railway, chief operator of the Postal Telegraph-Cable Company, and for a

JAMES H. GINGRICH.
Chief Operator Postal Telegraph-Cable Company, Harrisburg, Pa.

period the position of an electrician at the company's main office in New York, subsequently returning to his former place at Harrisburg, which, as at first stated, he continues to hold. As an electrician and telegrapher, Mr. Gingrich has an enviable record to his credit.

J. Z. Hayes, of the Postal Detroit Office.

John Z. Hayes, who holds the position of chief operator of the Postal Telegraph-Cable Company at Detroit, Mich., is demonstrating his ability as an electrician at that point, for he is a clean-cut and capable man. He hails from Missouri, in which state he was born at St. Louis, April 17, 1862. When but a lad of fifteen, in 1877, he started on his telegraphing career, beginning as a messenger for the old Atlantic and Pacific Telegraph Company. It is said that "like boy, like man," and it is remembered that young Hayes made an excellent record when in the messenger

JOHN Z. HAYES.
Chief Operator Postal Telegraph-Cable Company, Detroit, Mich.

service. Like others who gain success, Mr. Hayes put thought and care into his work; he studied and experimented; he wanted to know things. After the various changes incident to most telegraphers, Mr. Hayes finally reached Detroit, and since May, 1889, has been with the Postal company, in whose employ he is recognized for his efficiency, and where he holds an excellent record.

John C. Carmody of Fitchburg, Mass.

John C. Carmody, manager of the Postal Telegraph-Cable Company and proprietor of the District Messenger Service at Fitchburg, Mass., is a typical representative of the shrewd, kindly, pushing New England character. Born at Springfield, Vt., September 21, 1862, where he received his early education, he acquired a knowledge of telegraphy at Charlestown, N. H., in 1882. During the four years following he was construction operator on the Connecticut River, Vermont Valley and Sullivan County Railroad. Subsequently he became manager of the Home Telegraph and Signal Company, then operating in connection with the United Lines Telegraph Company at Kansas City, Mo. Returning East in 1887 and engaging in both the commercial and railroad telegraph service, first in Vermont and then in New Hampshire, he went to Fitchburg early in 1890 to enter upon the duties as manager of the Western Union Telegraph Company. Almost immediately thereafter he accepted an

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offer made by the Postal Telegraph-Cable Company, and on March 19, 1900, opened the office of this company at Fitchburg, becoming its manager. Here he has since remained, successfully building up a large business at this busy and growing industrial point. As a personal venture, he established a district messenger service in 1893, which he has since maintained at a high state of excellence.

J. C. CARMODY.
Manager Postal Telegraph-Cable Company, Fitchburg, Mass.

Nathaniel Hucker, Postal Traffic Chief at Buffalo.

Nathaniel Hucker, a forty-niner of the telegraph, traffic chief of the Postal Telegraph-Cable Company, Buffalo, N. Y., was born at Glastonbury, Somersetshire, England, January 28, 1832.

NATHANIEL HUCKER.
Traffic Chief Postal Telegraph-Cable Company, Buffalo, N. Y.

He entered the service of the Buffalo and Canada Junction Telegraph Company, at Buffalo, as a messenger in February, 1847, and after a few months was advanced to the position of operator. He remained in this capacity until 1850, when he entered the service of the Erie and Michigan Telegraph Company as manager. Here he continued until August 1, 1855, when he assumed the duties as manager of the House printing system. He was in this position when the Western Union Telegraph Company was organized, and he became its first manager in Buffalo, holding that office together with that of chief operator until May 1, 1881. On October 15, of that year, he was appointed manager of the Mutual Union Telegraph Company, with which he remained until August, 1883, when he returned to Western Union employ for ten years as press operator with the Buffalo Commercial. For nearly fifteen years he has filled the position of traffic chief, as first stated, of the Postal Telegraph-Cable Company.

H. D. Reynolds, Postal Superintendent, Buffalo.

Harvey D. Reynolds, superintendent of the Postal Telegraph-Cable Company at Buffalo, N. Y., a position he has continued to hold from the early history of the company itself, was born at Newfane, Niagara County, New York, January 26, 1850. He entered the telegraph business in 1862 at Lockport, N. Y., where he speedily became an operator for the New York Central Railroad. Subsequently in succession he was employed as a railway operator at Medina, Suspension Bridge, Syracuse, Oswego, Utica and Rochester, N. Y. His first service with a commercial company was at Buffalo in 1882, for the Western Union Telegraph Company, where he became night manager, resigning to become chief operator for the Mutual Union, and again returning to the Western Union. On January 1, 1884, he became manager of the new Postal office in Buffalo, and in February, 1891, was promoted to be superintendent. He has worthily

HARVEY D. REYNOLDS.
Superintendent Postal Telegraph-Cable Company, Buffalo, N. Y.

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filled the place he occupies, discharging its duties with ability, for he is a man of many parts, a skilled operator. Mr. Reynolds is president of the Old Time Telegraphers' and Historical Association, now in the second year of such occupancy due to the fact of the usual yearly reunion being omitted in 1907.

C. B. Arrington, Postal Superintendent at Nashville, Tenn.

Charles B. Arrington, who now under the rearrangement of districts, in effect January 1, 1908, has been transferred from the superintendency of the Postal Telegraph-Cable Company, at Jacksonville, Fla., to the wider sphere of activity of which Nashville, Tenn., is the headquarters, is numbered among the younger men in the service to reach high official position. He was born at Trenton, Ky., August 20, 1875, and is therefore now in his thirty-third year. He began his business career in 1890, when he entered the telegraph service of the Louisville and Nashville Railroad in his native place, as an operator. His connection with the railroad covered the years until 1896, during which time he was variously and at different places, operator and train despatcher, filling the latter position for the Missouri, Kansas and Texas Railway system, at

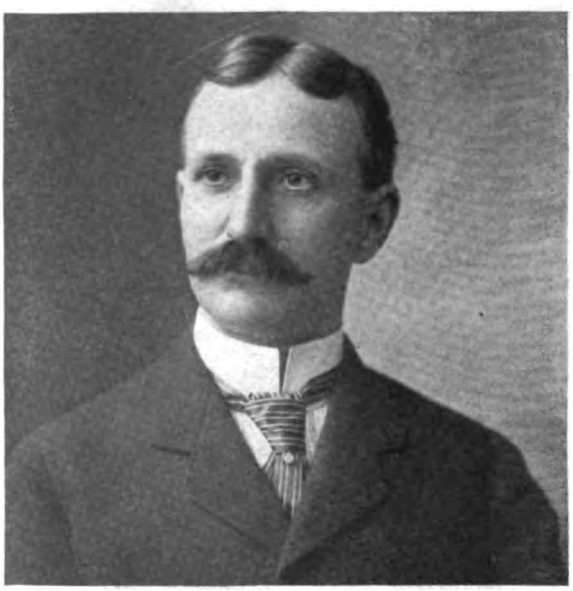
C. B. ARRINGTON.
Superintendent Postal Telegraph-Cable Company, Nashville, Tenn.

Denison, Tex., for the Louisville and Nashville Railroad at Birmingham, Ala., and for the Southern Railway at Charlotte, N. C. Abandoning railroad telegraphy for the commercial field, he became an operator for the Western Union Telegraph Company at Nashville, Tenn., during part of 1896-97, after which, in 1898, he went with the Postal Telegraph-Cable Company, at New Orleans. For a brief period in 1899 he was engaged in mercantile business in Kentucky on his own account, but soon again returned to railroad work, this time as agent and cashier for the Illinois Central Railroad in Mississippi and Louisiana. In 1900 he was appointed traffic chief of the Postal company at New Orleans, the following year being made chief operator, a position he has since held continuously.

Mr. Arrington has always been a conscientious worker and a close student, with keen powers of observation, nothing of value appearing to have escaped his notice. His technical acquaintance in the general field of telegraphy has been of such a character that his services have been brought into requisition in connection with submarine cable work as well as that of aerial and underground telegraphs.

C. M. Baker, Postal Superintendent of Construction, Chicago.

Charles M. Baker, superintendent of construc-



CHARLES M. BAKER.
Superintendent of Construction, Postal Telegraph-Cable Company, Chicago, Ill.

tion, of the Postal Telegraph-Cable Company at Chicago, is a man of varied accomplishments, and in all of the several offices of responsibility to which he has been called at different times, has brought to each the abilities possessed by a well-trained mind. Mr. Baker was born at Alexandria, Pa., April 13, 1854. He entered the telegraph service at Dwight, Ill., in 1868, as operator and lineman for the Great Western Telegraph Company, a position he held until 1873, when he was appointed to a similar position with the American Union Telegraph Company, the successor of the former, also at Dwight. After the consolidation of the latter with the Western Union Telegraph Company he was appointed superintendent of construction of the Mutual Union Telegraph Company, and superintended the construction of the lines of that company from Chicago to St. Louis and Kansas City, and to all other points in the West reached by that company. From 1881 to 1883 he was special agent for the western division of the Western Union Telegraph Company. In June, of the latter year, he was appointed superintendent of construction of the

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Postal company, with headquarters at Chicago, Ill., which position he held until 1898, when he was promoted to be general superintendent of construction, an office he held until advanced to that of assistant general superintendent, vice E. J. Nally, now vice-president and general manager of the company, then elevated to be general superintendent of the western division.

Mr. Porteous, Postal Manager at New Orleans.

William A. Porteous, until lately superintendent of the Postal Telegraph-Cable Company at New Orleans, but now, owing to a rearrangement and cutting down of the number of districts, manager of the office in that city, a position he has hitherto held in conjunction with the superintendency, is a native of the city in which he is located. He was educated in the public schools there, and began business life as a messenger boy on the floor of the Cotton Exchange. He shortly afterward went into the office of the Western Union, where he learned telegraphy. From that time on his rise was rapid. He secured a position on the Louisville and Nashville railroad as operator and agent at Bay St. Louis, and from there went west, with the Texas and Pacific. He was afterward connected with the New Orleans and Northeastern and the Southern Pacific.

Returning to New Orleans in 1889, he went into the service of the Western Union Telegraph Company, remaining in their employ until the Postal Telegraph Company opened an office

W. A. PORTEOUS.
Manager Postal Telegraph-Cable Company, New Orleans, La.

there in 1891. Of this he was appointed manager in which capacity he has since remained with the addition of the superintendency before referred to. Mr. Porteous has an engaging personality, has abundantly demonstrated his managerial abilities, and is popular among the business men of the Crescent City.

Mr. Porteous is a member of the Masonic fraternity and Elks, the Young Men's Gymnastic Club, the Transportation Club and is a Master Pythian.

Thomas W. Carroll, Division Superintendent, Postal Telegraph-Cable Company, Chicago.

Thomas W. Carroll, who has just been appointed division superintendent of the Postal Telegraph-Cable Company at Chicago, ranks among the younger men in the service to reach high position. He was born at Cleveland, Ohio, January 22, 1871, and became a member of the Postal force in that city in 1888. His subsequent record as an operator both at Cleveland and

T. W. CARROLL.
Division Superintendent Postal Telegraph-Cable Company, Chicago.

Pittsburg, was full of promise, and speedily paved the way for his being promoted to the place of repeater chief in the overland service at Albuquerque, N. M., followed by that of day chief operator at Denver. In the meantime, his electrical training had not been neglected, and proficiency acquired in this particular led to his being transferred to New York, where he was given the post of an electrician in the electrical department of the Postal's home office. Receiving the appointment of assistant electrical engineer at the Chicago office, he filled that situation from April, 1901, to October 1, 1906, when he was elevated to the superintendency.

His present appointment carries still upward a man who has won his way in the telegraph service because of inherent abilities that have been developed by study and close application to duty.

W. P. S. Hawk, Postal Superintendent at Salt Lake City.

William P. S. Hawk, superintendent of the Postal Telegraph-Cable Company at Salt Lake City, Utah, was born at Oxford, Ohio, April 24, 1865. Young Hawk was a boy of but twelve when he found employment in the telegraph service. By the time he was twenty years old he had successfully acquired the art of telegraphy. During the years from 1885 to 1887 he served as

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an operator for the Cincinnati, Hamilton and Dayton; Indiana, Illinois and Iowa, and the Missouri Pacific railroads, respectively. He was then appointed manager of the Rocky Mountain Telegraph Company at Fox Benton, Mont., September, 1887, to November, 1890; operator an dmanager of the same interests at Helena, Mont., to November, 1892, and general manager of the system to July 1, 1898. At the latter date he was appointed to his present position, with headquarters first at Helena, which were afterward removed to Salt Lake City. Mr. Hawk possesses a wide acquaintance with the district over which he presides, considered both in its physical and commercial

W. P. S. HAWK.
Superintendent Postal Telegraph-Cable Company, Salt Lake City, Utah.

aspects; he knows its needs and its personnel, and in his administration has made an exceedingly capable officer.

E. E. Cord, Chief Operator, Postal Telegraph-Cable Company at New Orleans.

Edward E. Cord, chief operator of the Postal Telegraph-Cable Company at New Orleans, an office to which he has lately been appointed, comes of a telegraphic family, for his father before him was a well-known operator in the Western Union service at Chicago. He was born at Mendota, Ill., May 27, 1866, and obtained his early education in Chicago, graduating from the high school. He afterward took a course in mechanical and electrical engineering at the Boston School of Technology. Entering the telegraph service he became a Western Union operator at Chicago, going thence to Peoria. Later he was appointed manager of the Kankakee office, resigning after the expiration of a year to enter the employ of the Peoria, Decatur and Evansville Railroad Company, at Peoria, as operator and clerk in the general freight and passenger department. From this point Mr. Cord returned to the employ of the Western Union at Nashville, Tenn., afterward accepting the managership of the office at Decatur, Ala. His appointment to the position of assistant night chief at the Memphis, Tenn., office soon followed, from which in turn he was further promoted to the posts of wire chief and chief operator. From Memphis he was transferred to a like position in the New Orleans office, in July, 1903. In the acquisition of his

EDWARD E. CORD.
Chief Operator Postal Telegraph-Cable Company, New Orleans, La.

services the Postal company has secured a man of exceptionally bright parts. Mr. Cord has always been a close student and in electrical engineering he has long been credited with possessing expert knowledge. He excels, perhaps, in comprehending multiple-circuit difficulties.

The director of the Norwegian telegraph lines has decided to extend a line to the North Cape, and it will be open for business during the tourist season next year. It is getting harder every year to find a secluded corner which is not invaded by mails and the telegraph. Visitors to the north coast of Iceland say that the postmaster at a fishing settlement where tourist steamers touch mourns the fact that a new burden has been added to his life by mail bags crammed with letters for the traveling public, and if the mails are not fast enough a New Yorker may catch a friend in Reykjavik by cable in a couple of hours.

Plans have been approved by the Secretary of War for rebuilding telegraph wires on the Yukon River; construction of a second wire between Fairbanks and Valdez and in sections of wireless telegraph lines and improvement and extensions to the cable lines.

The interior telegraphic system at Sierra Leone consists of about two hundred miles of land line. The chief electrician and director of telegraphs is Sigismund L. Farmer, Water street, Freetown.

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Telegraphy and Typewriting.

BY A. C. REILEY.

Typewriting and shorthand have been called "the twin arts." Doubtless to the ordinary commercial stenographer, who knows the typewriter only in its relation to shorthand, this may seem like the merest truism. But to the telegrapher, who knows the typewriter on another side entirely, this common figure of speech brings some interesting reflections. "Typewriting may be the twin of shorthand," we hear him say, "but it is also the twin of telegraphy." This is certainly a case of very mixed relationship for it thus appears that typewriting is, at one and the same time, the twin of two different arts having little or no relation to each other. This way of putting it simply serves to illustrate most forcibly the universality of the writing machine and the many and widely different fields in which it has made itself an essential factor.

In claiming special kinship and twinship with typewriting the art of telegraphy has some prior claims which will bear the test of any scrutiny. The relation which exists to-day between typewriting and telegraphy was not an afterthought as many have supposed; on the contrary, it dates from the birth of the typewriter. Indeed, it dates from a time before the commercial birth of the writing machine. For the machine before it ever appeared on the market had already been marked out and singled out for the indispensable part which it now plays in connection with telegraphy. We suppose this fact will come as news even to many telegraph operators, therefore the early history of the typewriter in connection with telegraphy should be of great interest to them.

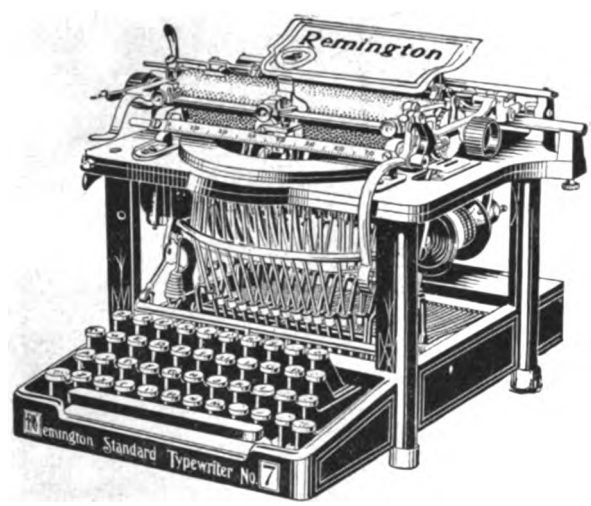
The year 1873 witnessed the commercial birth of the typewriter, for it was in that year that the Remingtons undertook the manufacture of the original typewriter, which bears their name and which is the standard machine to-day among telegraphers not only in this country but the world over.

However, no less than five years earlier, namely, in 1868, the machine which then existed only as an experimental model in the hands of its inventors, attracted the attention of a well-known telegrapher in the employ of the Western Union Telegraph Company, Chicago, who foresaw with prophetic vision its importance to his craft. This telegrapher was E. Payson Porter, and the mention of this honored name at once brings up one of the conspicuous figures in the history of telegraphy. Mr. Porter, who is still living, is not only one of the deans of telegraphy, but is also the pioneer "mill" operator. He was not only the first to use the machine himself, but he also pointed the way for its adoption to the other members of his craft.

When Mr. Porter, in 1868, for the first time saw and operated the typewriter, he astonished the inventor by the rapidity with which he manipulated the keys of the machine at first sight. His skill was due to the fact that he had formerly worked a "House" telegraph printer. It was through this association that the present Remington or standard keyboard had its origin.

"During an interview with the inventor, C. L. Sholes, of Milwaukee, in 1869," writes Mr. Porter, "I was promised the handsomest typewriter that could be manufactured upon condition that I could copy successfully from the telegraph. When the machine came to me, and after a few days of practice, I took it into General Stager's office. A sounder and key were placed upon the table and the General was the first to manipulate the same for me to copy, which I did readily. Colonel Lynch then attempted to 'rush' me, and failing to do so, an 'expert' sender was sent for from the operating room. A thorough trial of my ability to "keep" up resulted so satisfactorily that the typewriter was taken into the operating room."

The foregoing description by Mr. Porter tells in a nutshell the whole gist of typewriting in its relation to telegraphy. It lies simply in the superior speed of the "mill" as compared with handwriting in receiving over the wire and it is just this difference in speed which, in the past thirty years, has revolutionized the telegrapher's profession. In the old days he was a good receiver who could keep up with the speed of a good sender, but, thanks to the typewriter, such speed is now possible to every one. The typewriter, therefore, has been a boon to telegraphy because it has increased the efficiency of all telegraphers, and it has also been a boon to countless thousands of individual operators because it has enabled those who were only second or third class telegraphers under the old conditions, due to their comparative slowness in receiving, to advance to the position of first-class.



As early as 1872, as a result of Mr. Porter's efforts, the machine had been introduced in the New York main office of the Western Union Telegraph Company, and a trial had also been made in the Western Union office in Philadelphia. Another pioneer in the field was Walter J. Barron,

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who was also a co-worker in the invention of the Remington typewriter. He brought an experimental machine to New York in the fall of 1871 to use in copying messages from the tape in the office of the Automatic Telegraph Company. Three or four more of these machines were put in the office in January, 1872, and were used for press and commercial business. These experimental models, like the first model of the Remington, when its regular manufacture was begun in 1873, were single case machines, writing capitals only, the carriage shift was moved by a foot lever, and, altogether, they were slow and cumbersome affairs compared with the swift Remingtons of to-day. Yet even in this imperfect state the machine had proved itself an essential adjunct to telegraphy and its future was assured.

During the subsequent history of the typewriter its use by telegraphers more than kept pace with its other uses; indeed, the fact that Mr. Porter and Mr. Barron had been the pioneer machine users became a tradition of the cult, and these gentlemen came to have countless imitators in the profession years before the writing machine had made any mentionable impression in commercial life.

One of the most important and epoch-making dates in the history of the typewriter was the year 1882 in which year Messrs. Wyckoff, Seamans and Benedict assumed control of the sale of the Remington. Under their vigorous management the typewriter immediately began to make far more rapid progress than it had done in its previous history. The following year, 1883, marked another important event. In that year The Associated Press adopted the exclusive use of the Remington typewriter, a policy to which it has ever since adhered. Those of our readers whose memories go back to the year 1883 will recall that the typewriter even at that time was little known in ordinary commercial houses. However, it had already become recognized as indispensable in the receiving of the long news messages which were peculiar to The Associated Press service. It will be readily seen that the speed of the receiver gained importance as a factor in proportion to the length of the message and this consideration led thus early to the exclusive adoption of the typewriter for this purpose and also of the Remington as the swiftest and most reliable machine. The action of The Associated Press in officially establishing the "mill" as a necessary part of the telegrapher's equipment, was soon imitated by the telegraph companies who placed "mill" operators on all their more important circuits.

In recent years the use of the typewriter for receiving has become well nigh universal. It has ceased to be regarded simply as a mark of the operator who stands high in his profession, but is now regarded as an essential to the equipment of every telegrapher who would make a success of his calling. Among railroad telegraphers the machine has come to be adopted almost universally. The operator in the little night office in the woods knows that he cannot hope to rise above that position unless he adopts the "mill," hence the click of the Remington has become as familiar a sound at the small and remote stations as in any of the larger centers. Another feature which has caused the machine to be adopted so universally by the railroad operator is its advantages for the writing of train orders. The large number of copies which can be made on the machine at one writing has commended it for this purpose and it is the testimony of railroad men that the superior legibility of the typewritten as compared with the pen-written train order has added a new factor of safety in railroad management.

The typewriter is an American invention and naturally it won its first triumphs in the land of its birth. The telegraph services of other countries, however, were not slow to perceive the many advantages offered by the machine in connection with telegraphy. The "mill" operator does not go by that name in other countries, but by whatever name he calls himself, you will find him to-day in Australia, in India, in Russia and, in fact, in every civilized country. The Remington Typewriter Company maintains two schools in India, one at Calcutta and the other at Allahabad, whose sole mission is to train native operators of the Indian telegraph service in the use of the machine. It seems as though it were only yesterday that we read that the Swedish government had adopted the typewriter in connection with its telegraph service and that "the telegrapher's mill," the Remington, was to be used exclusively. These developments in foreign lands are of course recent events compared with the adoption of the typewriter in this country, but they show the "manifest destiny" of the typewriter to win universal recognition as an indispensable adjunct to telegraphy.

These facts are of course familiar to the up-to-date telegrapher, but they convey a message to other operators which their interests demand that they read and read aright. The purport of this message is that no telegrapher to-day can make any mark in his profession nor can he hope to secure any of the better positions unless he receives on the typewriter. The typewriter has made his advancement possible and at the same time has become indispensable to his advancement. He must adopt both of the twin arts, else he has no complete profession—he has only half a profession—and half measures do not command success in this present day world.

Edward Payson Porter, Operator.

Edward Payson Porter, of the Western Union Telegraph Company, New York, was born June 16, 1834. In June, 1846, he entered the telegraph service as a messenger in the Geneva, N. Y., office and in 1849 he was made its manager. When the House printing system was introduced, Mr. Porter entered the Rochester, N. Y., office as a student,

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working the Morse system on the Genesee Valley line at the same time, and later for a few weeks also at Utica, N. Y., and at Albany, N. Y., after which he took a position on the New York, Albany and Buffalo line at New York City. He soon returned to the Morse system, working upon the "Union Line" between New York and Boston, in the New York office, and later on the New York, Albany and Buffalo line in Buffalo. In 1860, Mr. Porter went to Chicago and became connected with the Western Union Telegraph Company, and by his

E. PAYSON PORTER.
Western Union Telegraph Company, New York.

efforts the managers of the Western Union Company located at Cleveland, and the managers of the New York, Albany and Buffalo company located at Utica, connected the lines with the use of a "button repeater" in Buffalo, and direct communication between New York and Chicago was established, the business being copied in Buffalo for the purpose of making the entries between the two companies. This direct communication was not, however, continued, and at the organization of the United States Telegraph Company, Mr. Porter placed some stock for that company in Chicago on the promise that direct communication would be secured with New York.

Later Mr. Porter constructed the Metropolitan Telegraph Lines in Chicago, connecting with the United States Telegraph Company, and afterward changing to the Western Union Telegraph Company, when he again became connected with the latter, and has continued with this company until the present time. When Mr. Porter learned of the invention of the typewriter by Mr. C. Latham Sholes, of Milwaukee, Wis., in 1870, he visited that city, and his former experience as a "printing" operator enabled him to astonish Mr. Sholes with his expertness in manipulating the typewriter machine. It occurred to Mr. Porter that the typewriter would be of service in connection with the telegraph, and upon his suggestion a machine was made to make as little noise as possible, and was used by him in the Chicago office, at first copying Washington "specials," and later for copying messages.

Mr. Porter enjoys the distinction of being the first keyboard operator in the world. On April 11, 1900, through the kindness of Mr. Francis W. Jones, Mr. Porter worked the Yetman keyboard transmitter as a test over the Postal lines between New York and Chicago, with Mr. Yetman in the latter city, and on June 27, 1902, he exhibited the keyboard transmitter to Col. Robert C. Clowry, president and general manager, and Mr. J. C. Barclay, electrical engineer, of the Western Union Telegraph Company, since which date Mr. Porter has used, and is still using, the keyboard transmitter in the Western Union office in New York, by which means he is enabled to renew his youth as an expert sender.

J. R. Dixon, Railroad Operator, Chicago.

John R. Dixon, an operator for the Chicago and Western Indiana Railroad, at Chicago, was born at Dixon, Ill., February 3, 1842. He entered the telegraph service as a messenger at Sterling, Ill., and in August, 1860, was given charge of the office. His patriotism asserted itself at the time of the Civil War, and enlisting as a soldier served during the last two years of that conflict in the territory from Cairo, Ill., to the Gulf, either with his company in the field or as an operator, in which latter capacity he rendered excellent service. At the close of the war Mr. Dixon was employed in the telegraph department and as an agent of the Chicago and Northwestern Railroad at different points, for fifteen years, and for the

JOHN R. DIXON.
Operator, Chicago and Western Indiana Railroad, Chicago.

past twenty-five years has been a trusted employee of the railroad corporation he is now serving. He is a member of the United States Military Telegraph Corps, and possesses a military record of which he is justly proud. Mr. Dixon has a wide circle of friends in both the railroad and commercial telegraph services, who hold their professional brother in high esteem.

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SHIRLEY M. ENGLISH.

General Manager Postal Telegraph-Cable Company of Texas, Dallas, Tex.

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S. M. English, General Manager, Postal Telegraph-Cable Company of Texas.

Shirley M. English, assistant treasurer and general manager of the Postal Telegraph-Cable Company of Texas, whose headquarters are at Dallas, Tex., takes rank among the most successful of telegraph managing heads in this country. The system over which he presides may not be as large as some others, but the high state of efficiency to which it has been brought as exemplified in its lines, its offices and in the personnel of its operating staff, is eminently to the credit of the master mind who is the directing power.

Mr. English was born at Mobile, Ala., March 31, 1862, and hence is in the very prime of life, with physical and mental capacity at their best. In 1874, when twelve years old, a tender age for a boy to be turned out into the world to begin his career, young English became a messenger boy in the telegraph service. Yet he took good care of himself, was attentive to his duties, careful and observing, and soon began to develop those qualities of mind and action that have since acted as propelling forces in his history. Competency always attracts attention, and the individual, boy or man, who exhibits qualities of sobriety, of intelligence and of push, which place the stamp of inherent ability, at least, upon one, need not want long for the outstretch of a helping hand to assist them in the struggle of life. Such persons are at a premium in this industrial world of ours; they are sought for, and eagerly secured when found. It is not strange then that the lad, English, got an early "lift," for he was one of the kind described. At a comparatively early age he became manager of the telephone exchange in his native city, and having learned telegraphy, was subsequently appointed secretary of the Mobile and Gulf Telegraph Company, later becoming superintendent of the Mobile City Electric Light plant. Going to the larger city of New Orleans, where he believed greater advantages might be realized, and entering the telegraph service at that point, in which he quickly became expert, he at length attained the position of quadruplex chief in the employ of the Western Union Telegraph Company. He afterward transferred his services to the Postal Telegraph-Cable Company, and for a number of years held the post of chief operator, developing into an electrician of very bright parts. Here it was in the Crescent City that he acted as agent for Telegraph Age, one of the very best representatives this paper ever had. In 1896 the Postal Telegraph-Cable Company of Texas was organized, with headquarters at Dallas. In April, 1897, Mr. English was invited to enter its service as an electrician, for at this time his reputation in this respect had become well established. In this new field of endeavor he made such a fine record for himself that two years later, in 1899, he was promoted to be assistant general manager, an advance which in June, 1902, was followed by his appointment to the office he now holds.

Mr. English's capacity for work appears to be without limit. Under his intelligent and aggressive administration the earnings of the company immediately began to show large increases, the net results of which were correspondingly astonishing as they were gratifying to the executive board. Since that time the earnings have steadily advanced year by year, testifying to the ability of the methods pursued by the energetic general manager.

The Postal Telegraph-Cable Company of Texas operates a system embracing lines and leased wires covering the territory west of the Mississippi River in southern Missouri and Kansas, Arkansas, Oklahoma, Texas and Louisiana, with outlets at New Orleans, Memphis, Tenn., Vicksburg, Miss., and Wichita, Kan., at which points it exchanges business with the Postal Telegraph-Cable Company, the Canadian Pacific Railway's Telegraph, and connecting systems, as well as the Commercial Cable Company, Atlantic and Pacific systems and their connections. It will thus be seen that this company fills an important department in the telegraph economy of this country, larger perhaps than it has been credited with.

The lines of this company are of the very best construction in which 210 and 300-pound copper wires are used for all through circuits. Its electrical equipment is of the latest and most improved kind, and is kept up-to-date.

Western Union Telegraphic Code System.

Telegraph Age extends its congratulations to the publishers of the Western Union Telegraphic Code System, of which Benjamin Nachmann is president and A. R. Carmichael manager. These gentlemen have succeeded in establishing, for the first time in the history of code publications, a universal code system. In 1902 they concluded negotiations with the State Department in Washington whereby the Western Union Code and International Cable Directory of the World were purchased by that department of the government to file with the embassies, legations and consulates of the United States throughout the world. By this means the publishers have established a universal code system, as our government is represented in practically every city of importance throughout the civilized world. If a corporation, firm or individual has a copy of the Western Union code and sends cablegrams to any of their correspondents abroad, the latter are at liberty to seek the book at the nearest United States Consulate to translate the message, which entails no cost whatever.

The Western Union code is invaluable and is said to be steadily supplanting the older codes, the use of which has always been limited. The code under review warrants recommendation, as by its use both Americans and foreigners can effect a very material saving in telegraph and cable tolls, as compared with any other similar work.

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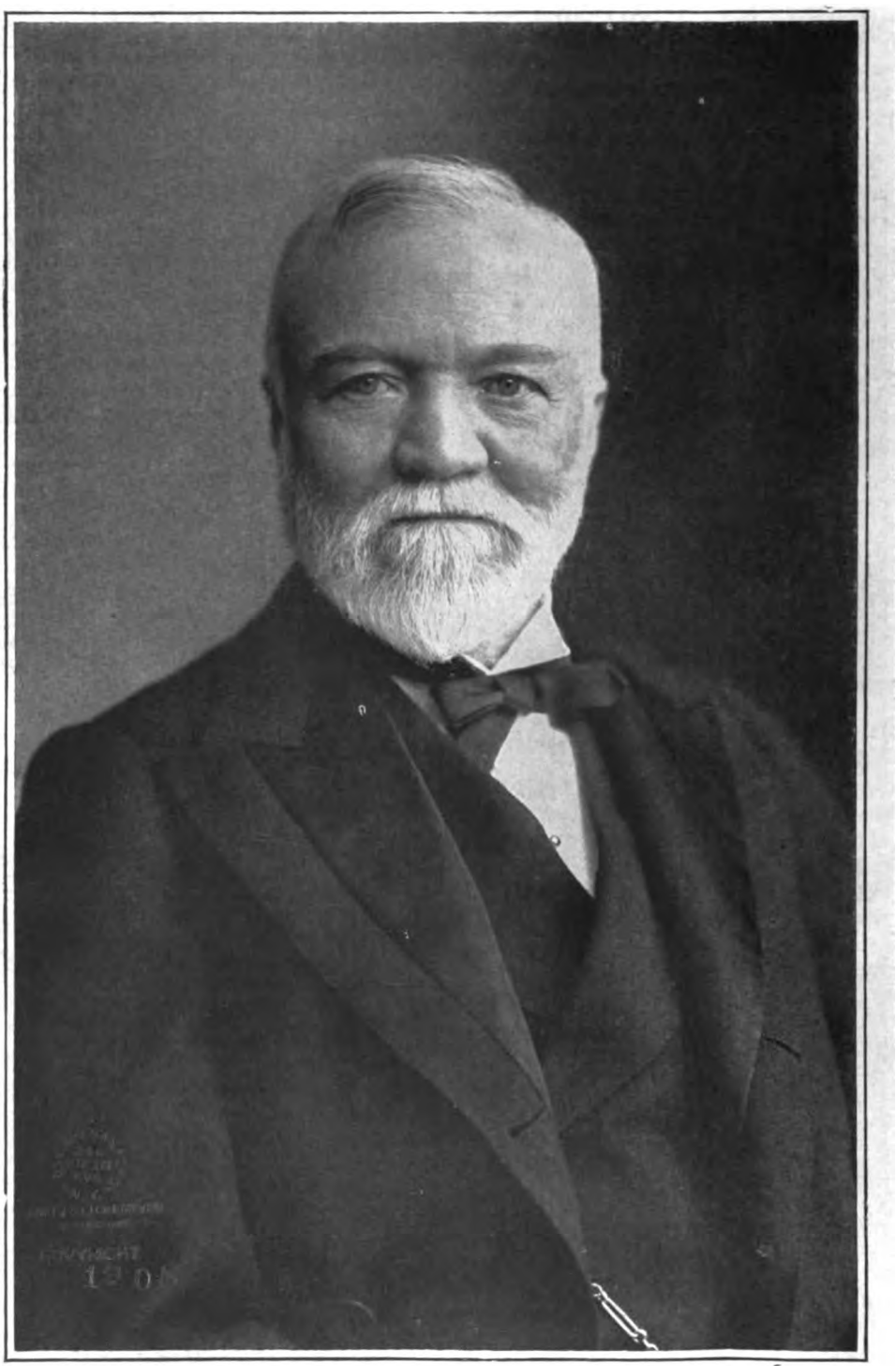

ANDREW CARNEGIE,
New York.

Photo by Davis & Eickemeyer, New York.

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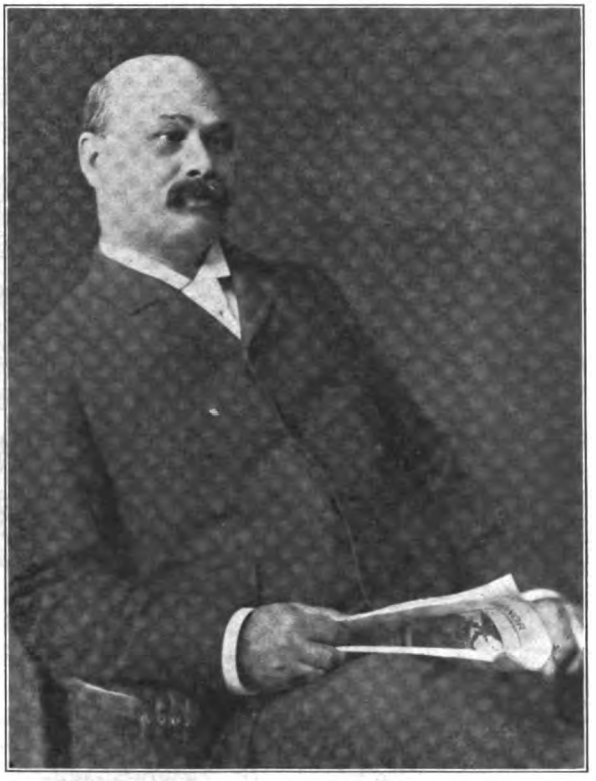
Andrew Carnegie of New York.

It is something to say that a former member of the telegraph profession is regarded to-day as the richest man in the world. Not alone is it wealth that gives to Mr. Carnegie his greatest prominence, although wealth enables him to carry out his many plans of philanthropy, but his benefactions to the race will cause his name to be the longest remembered. From employment when barely thirteen years of age in 1848, as a messenger boy at Pittsburg for the Ohio and Atlantic Telegraph Company, at $2.50 a week, to the possessor of individual wealth of a magnitude such as the world had never before witnessed, is a transition of which there are parallel cases but no equals. In briefly referring to the chief points of his career he describes himself as being at present a "man of all work." Mr. Carnegie still retains a kindly feeling for the telegraphic profession born of his own early experiences, and he is an honored member of the Old Time Telegraphers' Association. He is regarded as the "father" of the United States Military Telegraph Corps. He was born in 1835 at Dunfermline, Scotland, and his attachment to the land of his birth, to the home of his ancestry, with which he divides his time with the land of his adoption, constitutes a trait of character revealing at once loyalty, tenderness and sympathy for the associations and traditions of the past even as he possesses them in a practical measure for those of the present.

James Kent, Manager of the Canadian Pacific Railway Company's Telegraph.

James Kent, of Montreal, is at the head of the Canadian Pacific Railway Company's telegraph.

Mr. Kent was born at Montreal, January 15, 1854. Leaving school at the early age of fourteen, he found employment with the Montreal Telegraph Company in its local office as a messenger boy. His transferrence to the operating room as a check boy soon followed. Of a quick and observing nature, he early discerned the possibilities that lay within the path of the operator, and accordingly improved the opportunity afforded him to study and acquire a knowledge of the dots and dashes. This he did and was soon given a position as operator. Here he passed the following five years of his life, closely studying the subject and developing into an operator of most expert parts. Then came his appointment as night chief, followed in 1883 by that of day wire chief. The latter place he continued to hold until August, 1886, when he resigned to cast his fortunes with the Canadian Pacific Railway Company's telegraph. This he did by accepting the position of circuit manager, tendered him by Mr. C. R. Hosmer, who was then engaged in extending the railway's telegraph system and at a time closely approaching the date when it was to be declared open for business. His work while holding this position was most acceptable, so that his promotion in 1890 to be superintendent of the eastern division was his reward. Later, when Mr. Hosmer retired from the managership the advancement of Mr. Kent to the head of the telegraph department followed as a natural sequence.



JAMES KENT.
Manager Canadian Pacific Railway Company's Telegraph, Montreal, Que.

WILLIAM J. CAMP.
Electrical Engineer, Canadian Pacific Railway Company's Telegraph, Montreal, Que.

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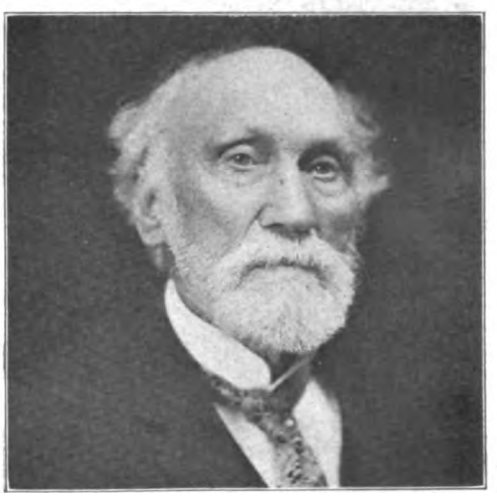
Orrin S. Wood.

Orrin S. Wood, the oldest known telegrapher in the world, reached his ninetieth birthday on December 14, last. His many friends all over this country and Canada, will rejoice to know that this venerable dean of the telegraph fraternity is well and in good health; for his is a personality held in affection by many still living who knew him and were associated with him in telegraph enterprise and management, when he was a directing and vital force among the active workers of that profession. Mr. Wood is living in retirement, dividing his time between his home in New York, where he passes his winters, and his country place at Turner, Orange County, N. Y., where his happiest days are passed amid nature scenes. Mr. Wood's first telegraph experience was acquired under the direct tutelage of Prof. Morse, with whom he had early association, becoming an operator in Washington in August, 1844, in connection with the original



ORRIN S. WOOD.
New York.

line of telegraph opened that year between Washington and Baltimore. As will be remembered, Mr. Wood built the telegraph line between New York and Philadelphia, and afterward that known as the New York, Albany and Buffalo line, along which route he also opened the principal offices. In the article printed elsewhere in this issue, it will be observed that Mr. Wood was the first superintendent and general manager of the Montreal Telegraph Company of Canada, filling this position for eighteen years. In fact, it was under his supervision that the line was built.

George H. Groce, Superintendent of Telegraph.

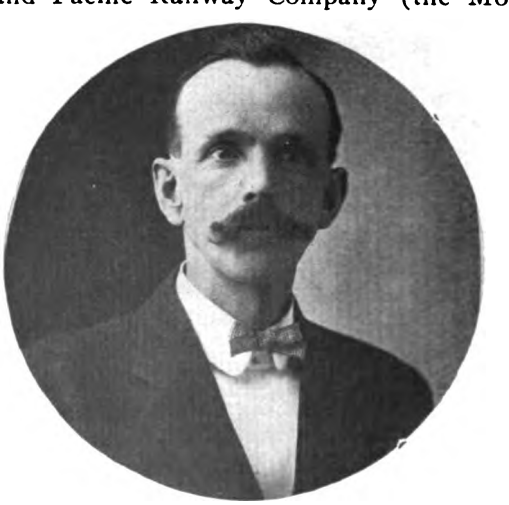
George H. Groce, of Chicago, superintendent of telegraph and signals of the Illinois Central Railroad, is a Pennsylvanian, the place and date of his birth being Tarentum, February 19, 1864. When sixteen years of age he entered the telegraph service of the Pittsburg and Lake Erie Railroad Company. This was in July, 1880, since which time he has had a varied and extended career in railroad work, filling positions that may be summed up by telegraph operator, agent, train despatcher, chief operator, division superintend-

G. H. GROCE.
Superintendent Telegraph and Signals, Illinois Central R. R., Chicago, Ill.

ent and superintendent of telegraph. These several positions he has held on various roads, the principal of which are the Pittsburg and Lake Erie and Chesapeake and Ohio. His present position, which places him at the head of the telegraph department of one of the great railway systems of the country, has been won by merit and elevates to that responsible post a man of varied telegraphic accomplishments and of fine executive capacity.

C. A. Parker, Superintendent of Telegraph of the Moffat Road.

Charles A. Parker, of Denver, Colo., the superintendent of telegraph of the Denver, Northwestern and Pacific Railway Company (the Moffat



C. A. PARKER.
Superintendent of Telegraph, Denver, Northwestern and Pacific Railway, Denver, Colo.

road), reached his forty-eighth year on September 2, last, having been born at New Albany, Ind., on that date in 1859. His entry into the tele-

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graph service was at Mexico, Mo., with the American Union Telegraph Company, when twenty years of age. Since that time he has had a varied telegraph career, mainly in the railway service, in which he has filled numerous positions, a number of them being in the capacity of superintendent of telegraph of different roads.

Edward J. Wehrley.

Edward Justus Wehrley, connected with the American Telephone and Telegraph Company, New York, is a native of Hanover, O., where he was born August 25, 1873. He began life as a telegraph messenger at Newark, O., when a lad of twelve, subsequently becoming an operator and assistant manager of the Western Union office at that point, afterward superintendent of the local electric lighting plant, and later being engaged in electrical construction work. In 1899 Mr. Wehrley came to New York to accept the position of assistant wire chief of the American Telephone and Telegraph Company, since which

EDWARD J. WEHRLEY.
Special Agent, American Telephone and Telegraph Company, New York.

time promotion has advanced him to the post of assistant chief operator, followed by that of a chief clerkship, special agent in charge of telegraph work in the traffic department and special agent in charge of the telegraph service leased wire department, which he now fills. Mr. Wehrley is a member of the American Institute of Electrical Engineers, New York Electrical Society and the Telephone Society of New York.

George W. Hickey, Former Telegrapher.

George W. Hickey, a former well-known telegrapher, who now holds a position with the Equitable Life Assurance Company, New York, is a native of Watertown, N. Y., where he was born October 25, 1862. He entered the telegraph service at Carthage, N. Y., in 1881, and his proficiency as an operator soon gained for him recognition, and his promotions carried him to the several posts of inspector, chief operator and manager.

During the Spanish-American War he was active in the operations of the Signal Corps in Porto Rico. Mr. Hickey still retains fellowship with the fraternity, for he is a member of the Old Time Telegraphers' and Historical Associa-

G. W. HICKEY.
New York.

tion, the Magnetic Club and other telegraphic organizations, and is always pleased to keep in close touch with interests with which much of his life has been closely identified.

Isaac Morris, American District Telegraph Company, Cleveland.

Isaac Morris is the manager of the American District Telegraph Company at Cleveland, Ohio. He was born at Cradley, England, August 4, 1853, and was but a lad of ten when he became a telegraph messenger at Dudley Port, that country.

ISAAC MORRIS.
Manager American District Telegraph Company, Cleveland, Ohio.

Coming to this country he early sought identification with the telegraph, in which he has had a constantly advancing career, for his knowledge of telegraphy acquired by practice, by study and by close observation, has been of a character to in-

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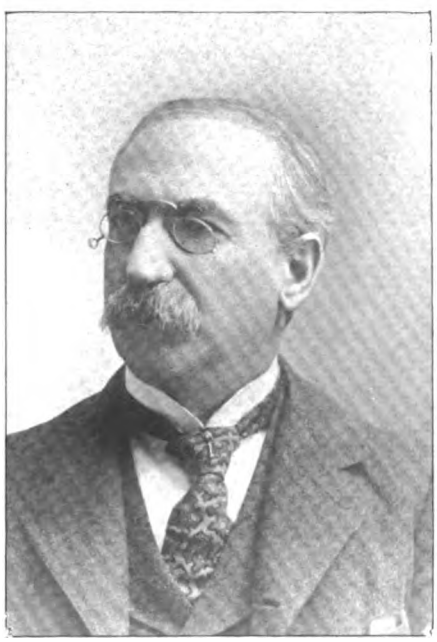
sure his selection for advancement. Promotion has carried him from the position of operator to those of traffic chief, wire chief and chief operator, finally placing him in control of the office first referred to.

John H. Shearer, Division Operator, Elmira, N.Y.

John H. Shearer is a division operator at Elmira, N. Y., of the Northern Central Railway Company, a part of the system of the Pennsylvania Railroad Company. Mr. Shearer is a native of York County, Pa., and was born September 18, 1843. His entry into the telegraph service dates from June 1, 1864, at Hanover Junction, Pa., in the employ of the same company with which he has since continuously remained. He worked in this office as an operator for two years, when he was transferred in the same capacity to the superintendent's office at Harrisburg, going thence, after two years, to Elmira to fill the appointment as a train despatcher. This position he filled until 1883, when he was promoted to the dual office of division operator and paymaster, both of which he has since held, until about two years ago, when he was relieved of the latter because of the increasing burden of the duties of the office. Mr. Shearer stands high as a thoroughly well-informed and expert telegra-



JOHN H. SHEARER.
Division Operator, Northern Central Railway,
Elmira, N. Y.

pher. He has earned for himself an excellent name in the business and social world in which he moves, and is recognized as a man of high probity of character.

David Homer Bates.

David Homer Bates was born in Steubenville, Ohio, July 3, 1843, and received a common and high school education in that town, and also in Pittsburg, Pa. In 1859 he entered the service of the Pennsylvania Railroad Company as messenger, soon learning telegraphy. His immediate superiors were David McCargo, superintendent of telegraph, and Andrew Carnegie, superintendent of the Pittsburg division. When the Civil War broke out young Bates was employed in the general superintendent's office at Altoona, and from there went to Washington, D. C., to enter the government telegraph service. When William B. Wilson resigned as manager of the

DAVID H. BATES.
New York.

War Department telegraph office, in March, 1862, Mr. Bates took his place, and in that position he remained until July, 1866, his superintendent being Major Thomas T. Eckert, as he was then called. During the four years of the Civil War, Mr. Bates had exceptional opportunities for personal acquaintance with Abraham Lincoln, which have been availed of in an intensely interesting volume recently published by the Century Company, to which editorial reference was made in Telegraph Age, November 1, 1907. In August, 1866, Mr. Bates entered the employ of the Western Union Telegraph Company as manager of the Washington office. A year later he succeeded David Brooks as superintendent at Philadelphia, and after intervals of service with rival lines, as general superintendent of the Atlantic and Pacific Telegraph Company, Atlantic division, and vice-president of the American Union Telegraph Company, Mr. Bates returned to his old love, the Western Union company, as assistant general manager and acting vice-president, which positions he held until 1884, when he became president of the short-lived but decidedly active Baltimore and Ohio Telegraph Company. When that system was turned over to the Western Union company in October, 1887, Mr. Bates retired from active service in the commercial telegraph field. For twenty years he has been vice-president of the Gamewell Fire Alarm Telegraph Company, whose system of fire and police alarms is installed in nearly two thousand cities and towns in the United States and abroad.

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F. P. Foster, Secretary of the International Association of Municipal Electricians.

Francis Perry Foster, of Corning, N. Y., secretary of the International Association of Municipal Electricians, now with the Corning Glass Company, but formerly superintendent of fire telegraph at Corning, is a native of the place in which he resides, and was born September 21, 1867. In early life he removed with his parents to Alabama, and from the first was obliged to earn his own living, at a time when most boys should be at school. Yet he was diligent and studious and made the most of himself. His early years saw much diversity of occupation, employment in various electrical pursuits, in which he showed much aptitude, affording him the greatest satisfaction. He also had some experience in a printing office, in which he worked at the case. Returning to his native place on January 1, 1886, where he has since resided, dentistry engaged his attention, a profession which he has since followed in conjunction with other duties. When the fire alarm system was installed in Corning in 1893 Mr. Foster was a member of the Fire Board, and his knowledge of electrical matters enabling him to settle a disputed technical question, he was given the position of superintendent, which he continued to hold until recently, when he entered the glass business. Mr. Foster was active in

FRANCIS P. FOSTER.
Corning, N. Y.

promoting the formation of the International Association of Municipal Electricians, and has served as the secretary of that body for many years, still filling the position. Mr. Foster is essentially a self-made man and is a close student.

Clement Lee, Superintendent of the Direct United States Cable Company, New York.

Clement Lee, superintendent of the Direct United States Cable Company, 60 New street, New York, is a man well qualified by long experience, careful training, as well as by a certain natural aptitude for the duties required, to fill the position he occupies in the cable service.

Mr. Lee was born at Whitchurch, Salop, England, in 1858, at which point in 1874 he began his telegraphic career as a junior clerk in the Postal telegraph employ. His appointment as an operator at Liverpool soon followed, a situation he held for two years. He then accepted a

CLEMENT LEE.
Superintendent of the Direct United States Cable Company, New York.

position in the relay office of the Direct Cable Company at Chester, from which, after three months' service, early in 1876, he was transferred to New York as an operator. The record made by Mr. Lee in this position, long held by him, was an excellent one. He was a careful observer, made the most of his opportunities, and obtained a comprehensive grasp of the business in which he was engaged, his conduct winning the approval of his official superiors. His reward came in 1899, when he was made manager of the office. His further promotion to the position of superintendent in 1905 was another recognition of his all-around abilities.

J. L. Henritzy, Superintendent of Telegraph.

James Lewis Henritzy, who is the superintendent of telegraph of the Colorado and Southern Railway Company at Denver, Colo., is a native of Pennsylvania, and was born in August, 1865. He began his career as a telegrapher at Slatington, Pa., in June, 1879, as a messenger, a lad who had not yet reached his fourteenth year. Improving his opportunities he learned to telegraph, and in November, 1880, secured a position as an operator and clerk in the employ of the Lehigh Valley Railroad, subsequently transferring his services to a like position with the Philadelphia and Reading Railroad at Reading, Pa., which he retained from September, 1882, to February, 1886. He was attentive to business and his habits were studious, and he became an expert and well informed operator. This secured

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his appointment in March, 1886, before he had reached his twenty-first year, as chief operator of the Postal Telegraph-Cable Company at Omaha, Neb. It was in August, 1891, that he resigned this place to accept the position of stenographer and cashier of a local brokerage concern in whose employ he remained for over five years. He then, in March, 1897, became chief clerk to the general manager of the Union Stock Yards Company located at South Omaha. From this place he retired to accept in July, 1898, a position as stenographer and operator with the Western Union Telegraph Company in Omaha, there remaining until the close on January, 1900. He then became chief clerk of the telegraph department of the Colorado and Southern Railway Company, Denver, from which, on November 1, 1906, he was promoted to be superintendent of telegraph of that system. As a telegrapher and

J. L. HENRITZY.
Superintendent Telegraph, Colorado and Southern Railroad, Denver, Colo.

an executive officer in the operating department of that railroad, Mr. Henritzy stands deservedly high.

Stephen E. Barton, of Boston.

Stephen E. Barton, now extensively engaged in the fire, marine and casualty insurance business at Boston, as a member of the firm of Starkweather and Shepley, has had a varied experience as a telegrapher. He was born at Oxford, Mass., December 24, 1848. Becoming an operator, he entered the telegraph service at Hilton Head, S. C., in 1863, during the Civil War, as a member of the United States Military Telegraph Corps, serving through the war. Going west, he was with the United States and Western Union telegraph companies at Cincinnati and other points in 1865-1866, serving afterward with the Atlantic and Pacific and Franklin telegraph companies at Springfield, Mass. During 1867 to 1869 he was in the employ of the New York, Newfoundland and London and the Cape Breton and Newfoundland telegraph companies; in 1870 serving in the cable department of the Western Union at 145 Broadway, New York, and in the Cape Breton cable office in 1871. In 1872-73 he was an operator in the Franklin Telegraph Company

STEPHEN E. BARTON.
Boston, Mass.

at Boston and at Worcester, Mass. For a while he was a correspondent of the Boston Herald. Branching into the fire insurance business in 1874, an occupation in which he has since remained, he is still, as he says, "one of the boys."

G. E. Fletcher, Hotel Proprietor, Sandwich, Ill.

George E. Fletcher, proprietor of the Sandwich House, at Sandwich, Ill., formerly a well-known telegrapher, and who still manifests his loyalty to the profession by continuing a subscription to Telegraph Age, which now dates back twenty-two years, was born at Elgin, Ill., November 2, 1855. He made his entry into the telegraph service at Lawrence, Kan., in 1872, and speedily became an operator of merit, at the same time developing abilities of an executive nature that

GEORGE E. FLETCHER.
Sandwich, Ill.

later won for him distinct recognition in the service. For, from the key, he was given mana-

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gerial positions, and in such capacity served the Western Union Telegraph Company at Pueblo and Central City, Colo.; Huron, South Dakota, and Bismarck, North Dakota; Great Falls, Mont., and Duluth, Minn. He was also manager of the Chamber of Commerce office of the North American Telegraph Company, at Minneapolis. Retiring from the telegraph business about three years ago, he entered that of hotel keeping, in which he is achieving success.

Albert W. Orton, of Rome, N. Y.

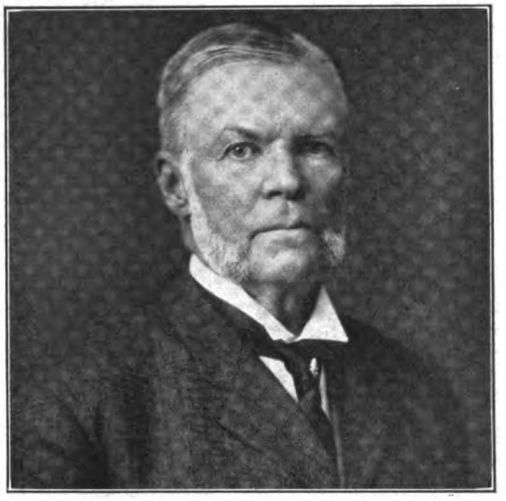
Albert William Orton, a former well-known telegrapher, is now the secretary and treasurer of the Rome Box and Lumber Company, of Rome, N. Y. Born in that city, October 5, 1842, it was also the point at which he entered the telegraph service in April, 1856, the railroad first engaging his attention. From Rome he went to Troy and subsequently to Albany in the employ of the New York Central Railroad. The Civil War breaking out he promptly tendered his services to the government as a telegraph operator, and as a member of the United States Military Telegraph Corps, he had an honorable, active and memorable career. That service placed him in the War Department, with the army, at Alexandria and Tennellytown, Va., and at headquarters, Department of Washington, at a point opposite the White House. Subsequently he was an operator for the Western Union Telegraph Company at 145 Broadway, working the Atlantic cable wire, afterward becoming manager of the

ALBERT W. ORTON,
Rome, N. Y.

branch office in the financial district of the Independent Telegraph Company, located at William and Beaver streets. Mr. Orton left the telegraph business in 1868, but although many years have elapsed since his retirement, he still retains his old time regard for the profession to which he often, and with pride, refers.

Charles A. Tinker, Retired.

Charles Almerin Tinker, of Brooklyn, N. Y., holds an honored name in the annals of telegraphy. Born at Chelsea, Vermont, January 8, 1838, he learned telegraphy at Northfield, in his native state, in the office of the Vermont and Boston Telegraph Company, in 1852. After three years' service as an operator he succeeded to the management of the office. Going thence to Boston, he finally went west to Chicago, where in January, 1857, he became an operator for the Illinois and Mississippi Telegraph Company. Other changes occurred, and



CHARLES A. TINKER.
New York.

in October, 1861, Mr. Tinker became an operator of the United States military telegraph service in the War Department at Washington, afterward being detailed as an army operator at the front, and later, by recall, being appointed chief operator and cipher operator at the War Department. He succeeded to the management of the office, finally closing up the affairs of the military telegraph. In 1867 he was appointed manager of the Western Union Telegraph Company at Washington, resigning in 1872 to become superintendent of telegraph and general train despatcher for the Central Vermont Railway, at St. Albans, Vt. In 1875 he accepted the appointment of general superintendent of the Central and Pacific divisions of the Atlantic and Pacific Telegraph Company, at Chicago. This company becoming merged with the Western Union, in January, 1879, Mr. Tinker received the appointment of superintendent of telegraph of the Baltimore and Ohio Railroad Company at Baltimore. In this position he became one of the incorporators with the late Jay Gould and David H. Bates, of the American Union Telegraph Company, with which the Baltimore and Ohio Railroad Company became allied. In 1881, when the Western Union Telegraph Company absorbed the American Union, the former tendered to Mr. Tinker the general superintendency of the eastern division, New York, the duties of which position he entered upon February 1, 1882. He retired from the telegraph service May 1, 1902.

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William Maver, Jr., Electrical Expert.

William Maver, Jr., began his electrical experience in 1870, with the Mutual Telegraph Company, in Montreal, Canada, in which city he received his early education. Coming to New York in 1873, he entered the service of the Western Union Telegraph Company as an operator, and subsequently became a quadruplex expert. In 1884 Mr. Maver was offered a position in the electrical department of the Baltimore and Ohio Telegraph Company and was ultimately appointed electrical engineer of that company. Shortly after the absorption of the Baltimore and Ohio Telegraph Company by the Western Union Telegraph Company, in 1889, Mr. Maver was tendered a position as an electrician with the latter company, but decided to branch out as an independent electrical engineer and expert, which he did making his headquarters in New York City, and where he has since enjoyed a uniformly successful practice. Since 1889 Mr. Maver has acted as consulting electrical engineer and expert for the Safety Insulated Wire and Cable Company of New York City, the New York Heat, Light and Power Company, the Consolidated Telegraph and Electrical Subway Company of New York City and for numerous other electrical interests.

Mr. Maver is well known as a prolific writer

WILLIAM MAVER, JR.
New York.

on electrical subjects, and has always kept in close touch with matters pertaining to telegraphy, being the author of the standard work, "American Telegraphy and Encyclopedia of the Telegraph," "Maver's Wireless Telegraphy" and other books.

S. B. Lefley and His Telegraph Key.

The Lefley telegraph key is the invention of S. B. Lefley, of Columbia, Pa. This key possesses a number of excellencies in construction, among them being the triple knife blade hinge, the use of which eliminates all side motion of the lever, thereby giving to it a very delicate touch. The rear end contact, situated at the same distance from the fulcrum as the key knob, gives a greater opening between contact points, thus making a clearer break. Besides this the contact plate on the end of the lever insures a firmer contact than if two small points were used. Then, again, the lever which is pivoted in the center has a perfect balance, and being thinner at the front end, is given a resilience which makes it easier on the sender, thus doing away with all nerve-racking jar.

This key appears to be rapidly finding its way into popular favor among operators, as its speed and relief-giving qualities become better known. In fact, its use has extended to all parts of the country, including far away Alaska. The inven-

S. B. LEFLEY,
Columbia, Pa.

tor of this clever instrument is a native of Ohio, in which state he was born at Waterville, August 7, 1860. Early in life he acquired a rudimentary knowledge of telegraphy, and as a lad began to show inventive genius which led him to construct at that time a crude, yet meritorious, telegraph key. He attained a fuller understanding of the dots and dashes, and for a period had a varied experience in the telegraphic field. For five years thereafter he held a position as engineer and operator with the Tide Water Pipe Line, going thence in the same capacity with the Standard Oil Company. For eighteen years he occupied, first the position of operator and later that of operator and engineer, with the Crescent Pipe Line Company. In the working out and in the development of the ideas embodied in the key which bears his name, Mr. Lefley has brought to his task a mind disciplined by the long years of application as a practical telegraph operator and by the careful study of his subject.

W. C. Hirchert, Erie Railroad Telegraph Manager at Salamanca, N. Y.

William C. Hirchert is the manager of the Erie Railway telegraph office at Salamanca, N. Y., a busy point, where he is rendering excellent service in a position where the experience gained by years of duty has proved his fitness

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and capacity for performing the work involved. He was born at Dunkirk, N. Y., March 26, 1860, where also he learned to telegraph, and where he first entered the service of the dots and dashes in 1881. On May 1 of the following year he became an operator for the Erie Railroad at Salamanca, N. Y., which place has since remained his home. On February 3, 1886, he was promoted to the position of joint manager of the Western Union and Erie Railroad telegraph office. This

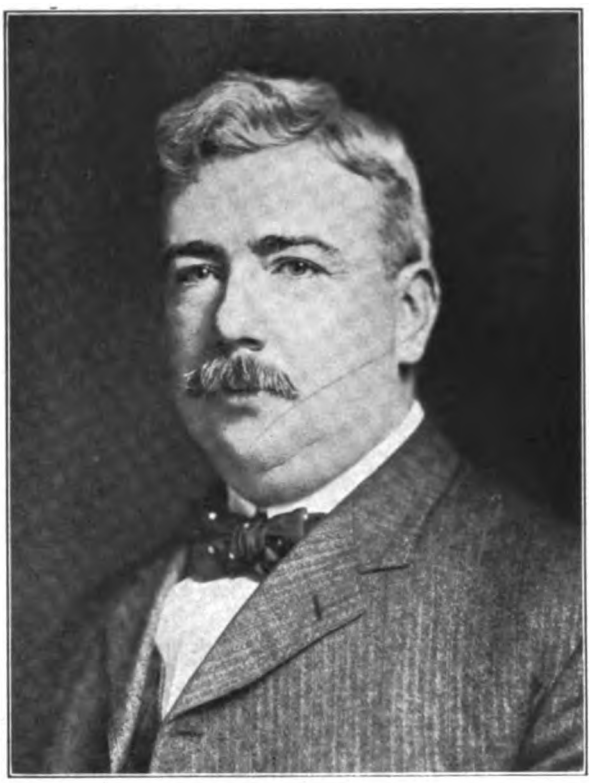
W. C. HIRCHERT.
Erie Railroad, Salamanca, N. Y.

he continued to hold for nearly twenty-one years, until January 15, 1907, when district offices being established, Mr. Hirchert was retained as manager of the Erie telegraph interests.

M. W. Rayens, President United District Messenger Company, New York.

The district messenger service in one form or another in the city of New York constitutes a distinct branch in the local business and social economy of the metropolis, that in its particular sphere of usefulness nothing else approaches. Probably no one has a broader knowledge of the messenger service in its every department than M. W. Rayens, of New York. He has served in the ranks, come up through every avenue of promotion, and has reached his position at the top because it has been earned.

Mr. Rayens was born in Ireland, February 8, 1864. His early education was acquired in the public schools of New York City. In September, 1877, he began his career as a messenger for the American District company. His promotion to a clerkship quickly followed, in which capacity he served in several different offices of his company. Acquiring the art of telegraphy he developed into an expert operator, later serving the Western Union Telegraph Company in this capacity at their branch office at 791 Broadway. At this point he remained for three years, each summer being assigned to the office at Long Branch, N. J. In 1884 he was placed in charge of the office at the Fifth Avenue Hotel, subsequently being transferred to the head of the branch office at 854 Broadway. In 1890 he was given the managership of the Western Union delivery department at the main office, 195 Broadway, two years later having his jurisdiction extended to include the receiving department as



M. W. RAYENS.
President and General Manager United District Messenger Company, New York.

well. His appointment as superintendent of the American District Telegraph Company soon followed. In 1903 he organized and became president and general manager of the United District Messenger Company, of which he is still the head, and which is located at 206 Broadway.

Mr. J. J. Ghegan, President of J. H. Bunnell and Company.

Mr. John J. Ghegan, president and general manager of J. H. Bunnell and Company, incorporated, 20 Park place, New York, like many another successful business man, is a graduate from the key of which he proved himself to be a most efficient operator. Born near Dublin, Ireland, in 1855, he came to this country when but a small lad. He first learned telegraphing in 1869 with the late John E. Zeublin, at the old Western Union Telegraph office at Third and Chestnut streets, Philadelphia. His first position as an operator was on the Camden and Amboy Railroad, under Robert Stewart, then superintendent of telegraph. This employment, however, he soon left to go with the Automatic Telegraph Company, at Chester, Pa. Here his habits of thrift were shown, when at the time of the great Boston fire in 1872 he took advantage of the occurrence and worked extra in

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the Western Union service in the neighboring city of Philadelphia. In November of that year, when but seventeen years of age, young Ghegan was made night manager of the Western Union office at Newark, N. J. At this point he successfully organized ticker circuits and a telephone exchange for the Gold and Stock and Western Union companies. Subsequently, on the consolidation of the Bell and Gold and Stock telegraph interests, he became manager of the Western Union offices in

JOHN J. GHEGAN.
New York.

Newark, a position he continued to hold until the consolidation of the American Union Telegraph Company with the Western Union, when he accepted service with the Mutual Union Telegraph Company in superintending the construction of its wires throughout northern New Jersey. Completing this work he went to Monterey, Mexico, there to become the general manager of the Mexican Northern Telephone and Telegraph Company. This position he filled with signal ability for two years, when he returned to New York on invitation to accept a responsible place with the well-known house of J. H. Bunnell and Company, with whose interests he has been continually identified ever since.

The varied experience Mr. Ghegan has gained as a telegrapher has stood him in excellent stead during these recent years of his business life. For, identified with a house making the manufacture of fine telegraphic material a specialty, his practical knowledge of all such requirements, coupled with keen business acumen, and a genial manner, has naturally won for him the confidence of the telegraph people as well as those with whom he is associated. In the recent reorganization of J. H. Bunnell and Company, his services received willing and just recognition in his advancement to the high position he now holds.

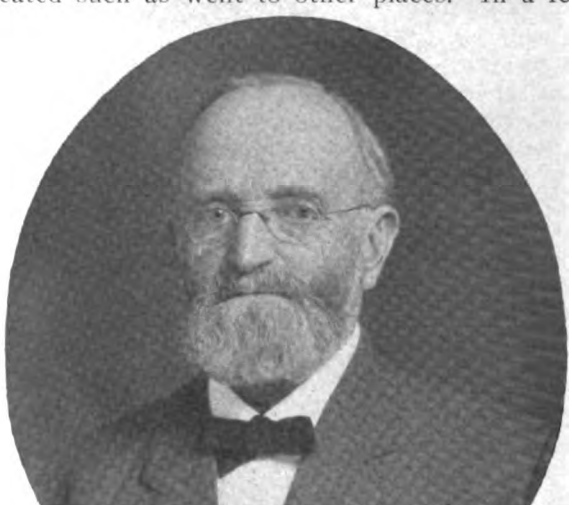
As an inventor Mr. Ghegan has also won much credit, recent examples of his aptitude in this respect being shown in his automatic telegraph repeater, which is coming into extensive use, and by his system of duplex diplex telegraphy, simple and ingenious of arrangement.

He has just been allowed a patent on a way duplex which looks very promising and on an improvement in the quadruplex, practical tests of which seem to indicate that the tantalizing reversal bug has at last been entirely eliminated and a perfect working four-sided quadruplex obtained.

Henry A. Reed and His Work.

Henry Augustus Reed, born at Carmel, Putnam County, N. Y., February 11, 1829. Worked on his father's farm, going to district school winters until seventeen years old. Taught school three years. While teaching in Carmel village in the spring of 1849, boarding with John S. Brown, who was operator there, became somewhat familiar with dots and dashes, the battery and instruments, and was given charge of that office July 1, 1849, before ever having tried to send or receive a message.

By working all night and all day on Sunday was able to receive on paper and send, so that Henry F. Makepeace (then chief of the New York office) succeeded in getting his messages and repeated such as went to other places. In a few



HENRY A. REED.
New York.

days he was able to stand alone. Carmel did very little business, but was useful as a testing and repair station. As it was thought that repairs on that section, reaching from White Plains to Stormville (sixteen miles south of Poughkeepsie), could be done more expeditiously from Croton Falls, Mr. Reed was directed to move the office to that place, and in March, 1850, he opened there the first office on the Harlem Railroad. In July, 1850, he was transferred to Hudson, N. Y., going

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as far as Poughkeepsie, on the Hudson River Railroad, which had been operating to that place less than a month. From Poughkeepsie he reached Hudson by day boat.

The winter of 1850-51 was the last for the old mail coach along the Hudson River. That winter the mails were carried by stage under military guard from Poughkeepsie to Albany, but the Hudson River Railroad ran its cars to Albany in the summer of 1851, ending the stage period there.

Mr. Reed remained at Hudson two years and then became first assistant to Sam Mac Gowan, manager of the New York, Albany and Buffalo Telegraph Company, whose office was located at Wall Street, New York, but city life did not agree with him and in March, 1853, he took charge of the Poughkeepsie office of the same company.

In March, 1855, Mr. Reed opened a book store in Poughkeepsie, moving the telegraph office into his store, where he had charge of it during the Civil War, but in 1866 his book business requiring his whole attention, he gave up telegraphy, having been engaged therein for seventeen years. In 1876 he became an accountant, making a specialty of the settlement of estates, adjustment of taxes, etc.

In 1878 he was given charge of the estate of Mrs. Samuel C. Bishop, which was operating the Bishop Gutta-Percha works, and was threatened with a suit for the infringement of the Simpson patent for the use of gutta-percha in insulation. The suit against the Western Union Telegraph Company for the use of the cables was before the courts for about two years. During that time Mr. Reed was watching the evidence and studying the literature and science of insulation and all patents thereon, foreign and domestic, and when papers were served on the Bishop attorneys he produced evidence which caused the withdrawal of the suits and saved the estate, although the Western Union had paid $100,000 damages. Soon after this settlement the present Bishop Gutta-Percha Company was formed in 1885, the legatees of Mrs. Bishop owning the stock. Mr. Reed was made secretary, but continued his accounting business until 1887, when opposing companies were getting the business and he was induced to give up his outside work and take full charge as manager, a position which he still holds. In 1892 he was made treasurer and in 1904 president.

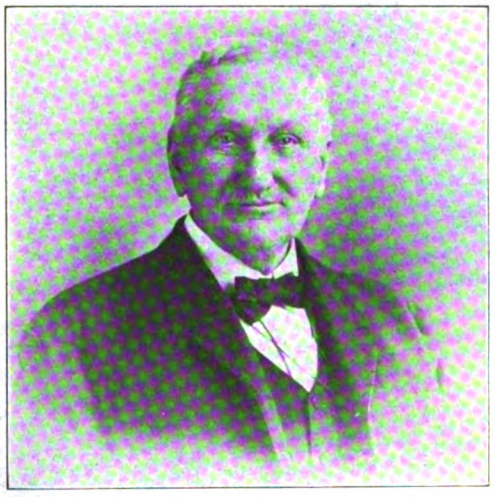
Mr. Reed has three sons, William Boardman Reed, C.E., Union, '82, who is now treasurer of the company; Henry Douglass Reed, M.E., Stevens, '92, who is vice-president and superintendent, and Louis F. Reed, attorney, who is secretary.

Only one of the seven original stockholders is now living, and Mr. Reed and family have acquired four-fifths of the stock of the company, which has increased in value many fold since he took charge a little more than twenty years ago.

Mr. Reed married in 1859 Alice Amelia Boardman, who, with the three sons before mentioned and a daughter, are all enjoying good health.

J. N. Worl, of Westfield, N. J., Retired.

James Norris Worl, of Westfield, N. J., now retired, is an old time telegrapher whose first employment in the telegraph service dates back to May, 1848, and whose subsequent career has been filled with interesting, exciting and historical import. He was born in Philadelphia, April 15, 1833, and is consequently approaching his seventy-fifth birthday. He possesses an extensive acquaintance, and during his career has been associated with many men eminent in the telegraph and cable services. One of the most dramatic incidents of his life was his arrest, because of his telegraph connection, by the government during the Civil War for alleged complicity in the bogus Presidential proclamation calling for 400,000 additional troops, the authorship of which was afterward traced to Joseph Howard, Jr., who was then and is now, a journalist. The story has been told in full in these columns in a sketch written by Mr. Worl himself. Another incident in the life



J. N. WORL.
Westfield, N. J.

history of Mr. Worl relates to the fact that in 1867, in conjunction with his brother, W. S. Worl, he secured a special grant from Congress giving the American Atlantic Cable Company, of which he was the principal member, the exclusive right for twenty years, to land ocean cables on the Atlantic coast. Under this right the shore connections of the United States Direct Cable and the French Cable were laid, the work being done by Siemens Brothers, of England.

Retiring from telegraphic interests in 1870, Mr. Worl became engaged in the manufacture of artificial stone and Portland cement, in which he has continued until within a comparatively short time. Incidentally, in 1872, he became interested in horse railroads, organizing and promoting the company and constructing the road from Hunter's Point, L. I., to Astoria and Steinway. In that year he was appointed postmaster at Ravenswood, L. I., holding that office through the successive administrations of Grant, Hayes and Arthur.

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Daniel H. Hebner, Telegrapher and Stenographer.

The subject of this sketch is a telegraph operator and stenographer, employed in the office of the commandant of the navy yard at Puget Sound, Wash. Not only is he proficient at the key, and likewise as a stenographer and typewriter, but he also has abilities as a writer. He has served in his present position for upwards of five years, his appointment, obtained under Civil Service rules, dating from August 26, 1902. His efficiency is reported at ninety-three per cent., and he is recommended for promotion. His present detail comes under the title of "stenographer, typewriter and telegrapher."

Mr. Hebner is a Canadian by birth, having been born at Zephyr, Ont., January 20, 1868. He acquired a business college education, in which he was well grounded in the art of telegraphy, and began his career as a telegrapher at Clearwater, Minn., in November, 1892. As an operator he became expert, acquiring an excellent reputation as such. In the line of his profession he held various important positions in the railroad service, notably in the employ of the Great Northern, Mesaba Southern, Minnesota Transfer and Chi-

DANIEL H. HEBNER.
Seattle, Wash.

cago Great Western. This covered a term of five years, included in which time he was for five months engaged in the railway mail service at St. Paul, Minn., as stenographer and tabulator.

In the line of commercial work Mr. Hebner performed the duties of stenographer and typewriter for about two years for the Konantz Saddlery Company, from which place he was appointed to his present position.

Mr. Hebner possesses a pleasing personality and brings to the practice of his profession a nice sense of its duties, intelligent application and painstaking effort.

H. G. Haddon, Martha's Vineyard Telegraph Company, Woods Hole, Mass.

Henry G. Haddon, of Woods Hole, Mass., president and general manager of the Martha's Vineyard Telegraph Company, was born at Long Pond, Newfoundland, November 18, 1866. His entry into

H. G. HADDON,
General Manager Martha's Vineyard Telegraph Company, Woods Hole, Mass.

telegraph employ was at St. Johns, that island, in 1885. From 1887 to 1890 he was manager, respectively, at the several points of Holywood, Harbor Grace Junction, Iogo and Grand River, N.F. From 1890 to 1893, he served as an operator at the cable station at North Sydney, C. B., and from 1893 to 1901 he was an operator for the Postal Telegraph-Cable Company, at Boston, Mass. At the latter date he received the appointment to his present position. Mr. Haddon since taking hold of his present undertaking has developed it into a successful business venture.

M. J. O'Leary, Secretary of the Telegraphers' Mutual Benefit Association.

M. J. O'Leary, secretary of the Telegraphers' Mutual Benefit Association, an office he has held since 1897, was born in Cork, Ireland, where he received his education and where he engaged in mercantile business for several years.

On arrival in this country he joined the telegraph service as clerk with the French Atlantic Cable Company, in November, 1880, where he remained till that office was closed June 30, 1882, when he entered the cable service of the Western Union Telegraph Company, in which he remained until he became identified with the organization with which he is now connected. Under his direction the Telegraphers' Mutual Benefit Association has reached a position of commanding influence in the insurance world, its membership has increased to 5400; benefits to

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the amount of $725,000 have been disbursed and the reserve fund has increased to $282,000, the largest amount in proportion to contingent liabilities held by any co-operative insurance association.

J. F. Gormley, Retired Telegrapher.

James F. Gormley, a resident of Boston, a well-known telegrapher, now retired, was born in London, England, March 3, 1836. He came to this country when but a mere lad. Finding a home in Hartford, Conn., he entered the telegraph service in that city in 1850, beginning as a messenger boy, soon, however, being taken into the office. Naturally of a bright and inquiring turn of mind, he took advantage of the opportunities offered him to learn telegraphy, and soon gained promotion to the position of operator. Eventually Mr. Gormley became highly expert at the key and enjoyed a fine reputation as an operator. During his life he has held numerous positions of responsibility in the telegraph service, at one time managing and operating a line of several miles, embracing five offices, within the city of New York. Mr. Gormley in the course of a long life has accumulated many facts and incidents regarding the telegraph. These he tells in interesting story, the first installment of which will later on appear in these columns.

Tom O'Reilly, Telegrapher and Journalist.

Tom O'Reilly was born in the City of Edinburg, Scotland, on December 5, 1854. He entered the government telegraph service in that country in 1874. He came to the United States in 1882 and was employed as an expert Wheatstone operator by the Western Union Telegraph Company in New York City. He has been a picturesque and interesting figure in labor circles. In 1883 he was a leading factor in the memorable telegraphic strike of that year, following which he was elected national president of the Telegraphers' Brotherhood in 1884, 1885 and again in 1886. Afterward he was appointed general organizer and lecturer for the then powerful organization, the Knights of Labor. He was editor of the Knights of Labor Journal from 1889 to 1894, when he was appointed assistant state librarian of Pennsylvania, which position he held during the entire administration of the late Governor Daniel H. Hastings, later being called to Washington to serve in the capacity of confidential clerk to the Hon. T. V. Powderly, commissioner-general of immigration. On the retirement of his chief, Mr. O'Reilly was assigned as immigrant inspector at Niagara Falls, N. Y., and after six months was transferred to the more important station at Montreal, Que., where he remained about one year. He then took a civil service examination for promotion with the result that he was appointed inspector in charge of the immigrant station at Buffalo, N. Y., and remained there three years. The severe winters of the lake region affected his health, the duties became too exacting and he resigned, returning to Philadelphia to resume journal work, which he found more congenial, and in which he is now engaged.

TOM O'REILLY.
Philadelphia, Pa.

G. M. Eitemiller, Western Union Wire Chief, Pittsburg, Pa.

George M. Eitemiller, wire chief of the Western Union Telegraph Company at Pittsburg, is a native of McConnellsburg, Pa., where he was born May 3, 1849. He entered telegraph employ as a messenger in his home town in July, 1863, and when he had began to get the hang of telegraphy, was given a position as an operator at Chambersburg, Pa., on the old Inland and Independent lines. The time spent at this point might properly be denominated as his student period. After this, on January 8, 1864, he opened the first telegraph office established at Somerset, Pa. In the fall of 1864, when working at Philadelphia in response to an application made to Major Eckert for a position in the military telegraph service, he was ordered to report to Major Gilmore, then in charge of the North Carolina department. His service in the military telegraphs was of short duration, for owing to his youth his parents objected and he returned to Philadelphia, there to enter the employ of the Atlantic and Ohio Telegraph Company, under David Brooks. After this, in the service of the Pennsylvania Railroad, during a period of double-tracking that road, young Eitemiller was detailed for special telegraph duty at various points. In 1868 he accepted a position with the Pacific and Atlantic Telegraph Company, at Philadelphia, going thence in the same employ to Pittsburg. In 1870 he entered the Western Union office at that point, in the fall of that year going to Richmond, Va., thence going to Savannah, Ga., as manager for the Southern and Atlantic Telegraph Company. In July, 1871, he came to New York and worked for the Western Union in the old office at 145 Broadway. Mr. Eitemiller returned to Pittsburg in 1876, where, in Western Union employ, he has since practically remained.

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The Telepost.

BY J. W. LARISH.

Since the sale of his synchronous multiplex telegraph system to the British government in 1885, Mr. Delany has given his best thought to automatic telegraphy.

In the system now perfected by him the record is made on a receiving tape by the electro-chemical effect of the passing of the impulse; no armatures to move, no electro-magnets to energize, no repeaters, no relays, no "balanced line". The moving tape is part of the circuit and the duration of the impulse determines the length of the mark, —short or long, dot or dash.

Thorough tests on telephone circuits prove that the Delany system can utilize telephone wires with no interference from or with conversations going on at the same time. Over a year's daily commercial work proves that the system is able, economically and accurately, under practically all kinds of weather conditions to handle a business on one wire that would require seventeen wires quadruplexed or sixty-eight used simplex by present methods.

By a special adaptation of this system a press message may be sent from New York to San Francisco at a speed of one hundred and fifty words a minute and leave at every town on the way a drop copy ready for immediate setting into type.

While some of the ablest and best inventors have worked along the same lines with only partial success, Mr. Delany's many years of constant and persistent effort have enabled him to perfect a system remarkable for the results it accomplishes, the simplicity and originality of its means and its complete adaptability for the needs of a telegraph company. Every feature is covered by patents, from the time a message comes to the operating department until it reaches the delivery department at the receiving station.

All patents are of comparatively recent date, including one covering most broadly the utilization of the static capacity of the line, which, until Mr. Delany's remarkable discovery, was, as is known to all telegraphers, the chief obstacle to accuracy and speed in automatic telegraphy.

Some ten years ago the Messrs. Sellers became convinced that the telegraph situation in the United States offered an unusually good field for profitable investment, and that the hand-labor methods so universally in vogue should be supplemented by machine telegraphy.

The Messrs. Sellers are from the South, where they are widely and favorably known in connection with industrial, commercial and educational matters, their people having been prominently identified with the best history of the Southwest from the earliest pioneer days.

Recognizing Mr. Delany as the ablest inventor in the telegraph field, and believing that he had discovered principles and invented a system which would control the telegraph business of the future, the Messrs. Sellers joined forces with him some years ago.

MR. DELANY AND HIS ASSOCIATES.

H. Lee Sellers. P. B. Delany. R. H. Sellers.

The result of the alliance is the perfected system owned by the Telepost Company, an independent telegraph company, which will give lower rates and better service than is now enjoyed anywhere in the world.

The Delany system has never been for sale, nor could it ever have been bought by either of the present telegraph companies or by any other interests.

Mr. Delany and his associates have had one thing only in view, which was the utilization of the Delany automatic system for the purpose of giving such low rates that telegraphing in the United States would no longer be an emergency method, but would be used by all classes as freely

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as it is abroad, and a service so good that social and ordinary messages would receive the attention now given only to stock exchange business.

This could only be accomplished by organizing an independent telegraph company entirely free from entangling alliances and outside of the atmosphere in which many bad features inherited from a crude and financially reckless past have been intensified and added to during the past thirty years in which the absence of competition has had a deadening effect on all ideas of progress and improvement.

For these reasons many propositions have been rejected and the determination was finally reached that the best method would be by making the Telepost Company strictly and entirely a popular enterprise.

Offices with full demonstration equipments are now open at 225 Fifth avenue, New York, and in the Union Trust Company building, Washington, D. C.

Arrangements are being perfected as rapidly as possible for the equipping of lines for commercial business, which is expected to be begun early in the present year.

Line building of the company will be under the supervision of Wilson H. Fairbank, well and favorably known in telegraph and telephone circles as the ablest line builder America has produced.

The best telegraphic experience and ability in the country will have charge of the management of the company's business, full information of which will be given in due time.

The Telepost Company will be a people's company in ownership as well as in service. Its stock will be scattered as widely as possible so that in every town and village in the United States there will be owners of the "Telepost" who will be interested in its welfare and success.

Joseph W. Larish, Electrician.

Joseph W. Larish is a well-known telegrapher and electrician, and is the electrical engineer of the Telepost Company, New York. He was born at Fountain Springs, Pa., March 31, 1848. He acquired his original knowledge of telegraphy when a student of the Lewisburg (Pa.) University in 1864, incidentally picking up his information. This led him to enter the service, which he did in Pennsylvania. Going to Kansas, he was an operator for three years, from 1867 to 1870, in the office of the general manager of the Kansas Pacific Railroad. The next four years he served as night press operator of the Western Union Telegraph Company at Buffalo, N. Y., following which he was repeater chief and had charge of the quadruplex and other repeating apparatus until 1884, when he was appointed manager of the Baltimore and Ohio Telegraph Company in that city. In 1886 he was made assistant superintendent, subsequently becoming superintendent of that company at Boston, a position he was holding when his company was absorbed by that of the Western Union. Mr. Larish was retained in Western Union employ, being appointed electrician for the third and fourth New England districts. While holding this position he originated and carried out many wise economies, and established himself as an authority in his department of applied electricity. His inventions at this time were also numerous and included several improvements in

JOSEPH W. LARISH.
Electrical Engineer, Telepost Company.

quadruplex apparatus, besides an electric semaphore block signal system of decided utility.

Coming to New York he held the position of electrical engineer of The United Press, from 1903 to 1905, then for a year was connected with the electrical department of the Postal Telegraph-Cable Company, during which time he invented a "city line" duplex, of which he is joint owner, and which is now in general use by that company. In April, 1907, Mr. Larish accepted the position he now holds.

What the College Degree Means in Technical Work.

Success is due, primarily, to the man and not to the institution. A degree from a reputable school is a great help to a man at the beginning of his career, especially if times are dull, positions hard to obtain, and if the man in question can secure also the personal indorsement of the teachers who knew him; but probably no collegiate degree is of any use to a man in his profession after he has been ten years out of school. The college offers a man an opportunity to train himself in those mental, moral and physical qualities which will bring him success. Let each student see to it that he avails himself of his opportunities to the utmost, and success will then be within his grasp.—Prof. George F. Swain in Boston "Tech."

Orders, if sent to Telegraph Age, Book Department, for any book required on telegraphy, wireless telegraphy, telephony, electrical subjects, or for any cable code books, will be filled on the day of receipt.

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WILLIAM H. BAKER.
Former Vice-President and General Manager, Postal Telegraph-Cable Company.

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William H. Baker, Former Vice-President and General Manager of the Postal Telegraph-Cable Company.

William Henry Baker, former vice-president and general manager of the Postal Telegraph-Cable Company, a position from which he retired in April, 1907, is now a resident at Bay Side, New York, a delightful suburban spot on the north shore of Long Island. Although having withdrawn from active service in the telegraph, he remains on the advisory board of the Postal company and is still a frequent visitor at his former place of business.

Mr. Baker was born at Buffalo, N. Y., April 13, 1855. Two years subsequently his parents returned to Brooklyn, N. Y., which had previously been their home, and there the son received his education. At the age of fourteen, he found his first employment in a law office in New York, and afterwards entered the service of a commission house. Soon after attaining his fifteenth year, application was made in his behalf for employment to Col. A. B. Chandler, at that time superintendent of the Western Union Telegraph Company, New York, who invited the lad to call at his office. The boy's gentlemanly manners and quick intelligence at once made a favorable impression on Colonel Chandler, which was strengthened during the course of the interview, by his careful observance of the rights of his present employer, and the necessity for giving due notice of his intended change, so that no inconvenience in consequence should be suffered. This incident occurring so early in Mr. Baker's career is mentioned as exhibiting a commendable characteristic in the moral make up of the lad. His capacity for work soon advanced him from the post of office boy, and he was assigned to a clerkship under the immediate direction of Edward C. Cockey, who then had charge in the general superintendent's office, of the accounts of all superintendents of the eastern division of the Western Union Telegraph Company, and also of the office accounts of the sixth district in that division. Under the constant and critical instructions of this prince of accountants, and the counsel of both General Eckert and Mr. Chandler, both of whom were warmly interested in the development of young Baker, the latter continued in various capacities in the service of the Western Union and later of the Atlantic and Pacific Telegraph Company, finally reaching the secretaryship of the latter concern. Early in 1885 he was appointed secretary of the American Electric Manufacturing Company. While his connection with this business was disappointing, it was so through no fault of his, and he acquired therein an acquaintance with electric and other machinery which proved to be eventually of much value. On resigning from this position Mr. Baker bought a membership in the New York Stock Exchange, having shown such aptitude for the peculiar business transacted there, as to lead both himself and some of his friends to believe it wise for him to engage in it. His own good sense soon led him to dispose of his interests in the "Street," immediately after which he entered the service of Theodore N. Vail, then president of the Metropolitan Telephone Company, with whom he continued for more than two years, and by whom he was highly esteemed, both for his business qualifications and his personal character. In the fall of 1889, Mr. Baker was made a vice-president of the Postal Telegraph-Cable Company, and assumed the duties pertaining to that position on the first of November of that year, shortly thereafter having added to his other duties that of general manager. His courteous manners, his close acquaintance with the details of the telegraph business, a natural fondness for architecture, mechanics, and electrical science, his tact in dealing with the peculiarities of men, and his judgment in administering affairs intrusted to his care, were recognized by all who came in contact with him in business, while his personal friendliness for the rank and file of the service, as well as for all coming within range of his close acquaintance, combined to make him one of the most popular men in the telegraph business.

In his well-earned retirement Mr. Baker carries with him the kindly remembrance and cordial good will of hosts of friends.

P. W. De Baun, chief clerk of the city superintendent's office, Postal Telegraph-Cable Company, New York, has been transferred to the operating department.

Mr. H. H. Hall, manager of the Postal Telegraph-Cable Company at Ashtabula, Ohio., was in New York during the holidays, visiting his daughter in Brooklyn.

The Direct United States Cable Company, with headquarters in New York at 61 New street, according to its yearly custom, is sending out a pad calendar for 1908. It is compact in form, neat in size, useful in purpose, and will find a welcome place on many a business desk.

W. B. Stuart, formerly manager at Macon, Ga., of the Western Union Telegraph Company, has been appointed manager at Savannah, vice J. Marshall, who has been made chief operator of that office. W. B. Powell, formerly chief operator at Savannah, has been made manager at Macon, Ga.

Charles L. Gondolf, who is on trial in New York for the sale of bonds stolen by William F. Walker, the defaulting treasurer of the New Britain (Conn.) Savings Bank, was, it is said, at one time the leader of a band of professional "wire tappers" and that while engaged in that business he met Walker and induced him to invest in some of his "sure things." It is said that Walker spent a good deal of the money he stole with Gondolf and his crowd.

TELEGRAPH AGE has helped many a telegrapher in his career. It will help you. Price, $1.50 a year. Send for a free sample copy.

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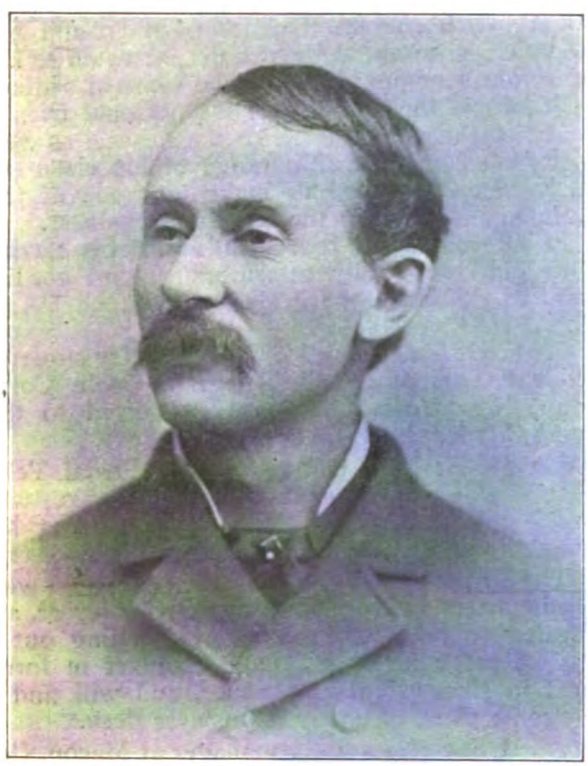
Frank J. Howell, of Corning, N. Y., Retired.

Frank J. Howell, of Corning, N. Y., a former well-known telegrapher, was born at that place December 26, 1847. He was early attracted to telegraphy by studying diagrams of the Morse method and reading Civil War bulletins, in which there was something peculiarly suggestive of the art in which he afterward became proficient. A class of eight or nine members was made up to study telegraphy under a local operator who was paid $25 by each for such tuition. Mr. Howell was further instructed by the late Hon. George M. Smith, formerly train despatcher on the Erie Railroad. Becoming skilled at the key he had no difficulty in securing employment, and his early experiences in Pennsylvania, as related by



FRANK J. HOWELL,
Corning, N. Y.

him, would make an interesting chapter by themselves. At this time, Mr. Howell says, the "woods were full" of ex-Federal and ex-Confederate military officers prospecting in oil well properties. After this in rapid succession Mr. Howell held numerous positions within a comparatively narrow radius, when the desire to travel lead him westward in November, 1868, to accept positions, first at Connersville, and afterward at Indianapolis, Ind., on the Cincinnati and Indianapolis Junction Railroad, under O. M. Shepard, chief operator, and who for several years and until lately was general superintendent of the New York, New Haven and Hartford Railroad. In the spring of 1869 Mr. Howell pushed further westward to De Witt, Iowa, on the Chicago and Northwestern Railroad. To avoid the rigors of an Iowa winter, he went South as far as Memphis, stopping at various points, and later to Louisville, Ky., there to become a copyist and night operator in the main office of the Louisville and Nashville Railroad. In February, 1870, he again returned to the service of the Cincinnati and Indianapolis Junction Railroad, first at Cincinnati, subsequently at Oxford, Ohio, and at Cambridge City, Ind. A second trip westward with temporary employment at points in Iowa, brought Mr. Howell's telegraph career to a close. In the fall of 1870 he engaged with an atlas-publishing firm at Galesburg, Ill., a business in the prosecution of which required him to furnish sketches of Illinois farm scenes, etc. In 1874 and 1875 he engaged in the publishing business at Edwardsville, Ill., as a member of the firm of Brink McCormick and Co., later in 1875 and 1876 being identified with the Missouri Publishing Company, of St. Louis. About this time graphic sketches illustrative of the camp of the Nez Perces Indians, near Leavenworth, Kan., under Chief Joseph, captured by General Miles; the burial of five of General Custer's officers at Fort Leavenworth; and at Ossawatomie battlefield, the dedication of a monument to John Brown, by the late Senator John J. Ingalls, drawn by Mr. Howell at this time and which were published in Frank Leslie's, attracted much attention. During the period following April, 1879, Mr. Howell made numerous sketches in California for atlas reproduction. Coming to New York, Mr. Howell spent some time in study at art schools, at the same time holding a telegraphic position. For several years he pursued the insurance business at New York, and during the Spanish-American War he furnished occasional sketches depicting local scenes in connection therewith for the Illustrated London Graphic. Mr. Howell, after inheriting an ample estate, returned to Corning to make that place his permanent home after a residence of thirteen years in New York, from October, 1887, to October, 1900.

J. W. Reed, Western Union Manager at Philadelphia.

John W. Reed, manager of the Western Union Telegraph Company at Philadelphia, comes from Illinois, where he was born May 11, 1866, at Urbana. It was in September, 1881, that young Reed, then a lad of fifteen, entered upon his telegraphic career, at Rosendale, Mo. He was quick to learn the meaning of the dots and dashes, and from the first was a good operator, so that when he reached the position of telegraph operator and station agent of the Kansas City, St. Joseph and Council Bluffs Railroad, he was accounted a "good man for the place." The commercial service, however, was more attractive to Mr. Reed than that of the railroad, and seeking employment therein was given a position as an operator for the Western Union Telegraph Company at Muscatine, Iowa. He subsequently served in the same capacity at Cedar Rapids, Iowa, Omaha,

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Neb., Butte, Mont., and Helena, Mont. During this period he had steadily gained reputation, and in many ways had demonstrated his abilities as an electrician and his capacity for executive direction. His next position was that of manager

JOHN W. REED.
Manager, Western Union Telegraph Company, Philadelphia.

at Durango, Colo., followed by a transfer to the head of the office at Colorado Springs, that state. Here his record was of such character as to lead to his appointment to the important office at Philadelphia.

Mr. de la Motte at the Sandy Hook Station.

Wilhelm Ernst Ludwig de la Motte, manager of the marine service of the Western Union Telegraph Company, at Sandy Hook, N. J., was born November 12, 1842, in Hohenwedstedt, Holstein,

WILHELM E. L. de la MOTTE.
Manager, Western Union Telegraph Company, Sandy Hook, N. J.

Germany. He entered the service of the telegraph at Norburg, Prussia, in 1865. In 1870 he came to this country, and in 1873 obtained employment with the Western Union Telegraph Company at the quarantine station, at that date located on Staten Island, first at Tompkinsville, and afterward near Clifton. January 1, 1875, he accepted a position with the Maritime Exchange, at Sandy Hook, N. J. In 1877 he again engaged with the Western Union Telegraph Company and went to Fire Island. Here he passed one year, going thence to the main office at 195 Broadway, New York. After two years, in 1880, he was appointed to the Sandy Hook position, where he has since remained. Mr. de la Motte's duties at this point are peculiar and constant, inasmuch as he reports the movement of all passing vessels. Messages for vessels are signaled by the international code flags from the balcony of the telegraph tower on a 140-foot flag pole.

Mr. Diehl, Postal Manager at Harrisburg, Pa.

Clark E. Diehl, manager of the Postal Telegraph-Cable Company at Harrisburg, Pa., is a native Pennsylvanian, and was born May 2, 1862. In 1878, when sixteen years of age, he

CLARK E. DIEHL.
Manager, Postal Telegraph-Cable Company, Harrisburg, Pa.

entered the telegraph at Sunbury, Pa., his first work being in the railroad service. Not until 1882 did he identify himself with commercial telegraphy, which was at Philadelphia in connection with the Western Union. Before the close of that year he accepted a position as operator with the American Rapid Telegraph Company at Harrisburg, being promoted to the management of the office in the following May, 1883. Here he continued as manager during the life of that company, retaining the place after the merger with the Bankers' and Merchants' Telegraph Company. When the Postal first opened an office in Harrisburg, Mr. Diehl was appointed its manager, a position he has since occupied. He is an energetic and progressive official, and maintains his office at a high state of efficiency. He enjoys an excellent reputation as an electrician.

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The Murray Automatic Page-Printing Telegraph.

(From a London Exchange.)

The Murray automatic page-printing telegraph system, which is now coming into considerable use for dealing with long distance and heavy telegraph traffic, has a rather curious history. The inventor, Donald Murray, was born in New Zealand and trained as a farmer. He subsequently spent twelve years in newspaper work in Auckland, New Zealand, and Sydney, Australia, and during his spare time he developed the idea of working the linotype machine automatically by means of a perforated paper tape. A model of the machine was made and shown operating a typewriter. In 1898 the inventor took it to New York, where it was acquired by the Postal Telegraph-Cable Company with the object of converting it into a printing telegraph, William H. Baker and Francis W. Jones, at that time vice-president and general manager, and electrical engineer, respectively, of the company, acting as sponsors for the infant system, which was familiarly known as "The Baby." In this way Mr. Murray was enabled to develop his device into the Murray automatic page-printing telegraph system, quite a different thing from what it was originally intended to be. After two years spent in developing the system in New York, Mr. Murray brought it to England in 1901, and it was then taken up by the British post office. Before it become a really practical commercial success a long series of improvements had to be made, and these have only been completed during the past year. This necessity for perfecting the apparatus has delayed its practical utilization, but a considerable number of installations are now in commercial operation, in England between London and Dublin, in Germany between Berlin and Hamburg, in Austria between Vienna and Prague, in Sweden between Stockholm and Gothenburg, in Russia between St. Petersburg and Kazan (1,000 miles of iron wire), and in India between Bombay and Calcutta (1,200 miles of copper wire). The practical trials of the Murray system over long iron lines in Russia have been so successful that the Russian administration has recently obtained an installation of the Murray system for St. Petersburg-Irkutsk, a distance of approximately 4,000 miles of iron wire. This will probably be worked with four repeating stations and an automatic retransmitting station at Omsk, located about half way of this distance. This will be the first practical working trial of the facility possessed by the Murray system of automatic retransmission of messages from the received tape. It is expected that in about a year it will be possible to conduct the interesting experiment of transmitting a message automatically from Dublin through London, Berlin and St. Petersburg to Irkutsk on Lake Baikal, a distance of about 6,000 miles, including 4,500 miles of iron wire and a single stretch of 250 miles of ocean cable. Additional circuits are being equipped with the system in Germany, and an installation is being constructed for Norway.

THE MURRAY AUTOMATIC SYSTEM, INSTALLED IN HEAD TELEGRAPH OFFICE, ST. PETERSBURG, RUSSIA. The INVENTOR IS SEATED AT THE TABLE.

The Murray automatic system is specially designed for working over long lines and for handling heavy traffic. In its capacity for working over long distances no other system, not even the Wheatstone Morse, it is claimed, can approach it. In comparative trials over long distances it has

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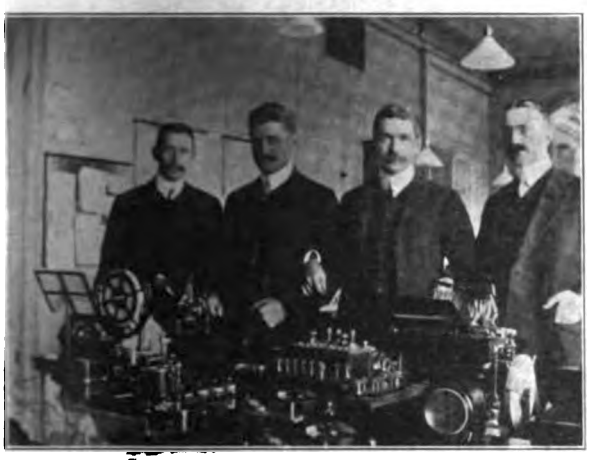
frequently beaten the Wheatstone in speed by from thirty to sixty per cent. In an experimental trial of the Murray system between London and Berlin a speed of one hundred words a minute simplex (600 letters a minute) was quite easily reached., This was over an English land line of one hundred and twenty-five miles, a repeating station and then two hundred and fifty miles of a four wire ocean cable across the North Sea, another repeating station and three hundred miles of land line in Germany.

The Murray automatic system has the great advantage that it does not print the messages direct at the receiving station. It prints indirectly from a perforated receiving tape. The advantages on long lines gained by automatic transmission from a perforated tape are generally recognized by telegraph engineers, but it is supposed by those unacquainted with the subject that the



VIEW OF A SET OF THE MURRAY SYSTEM AT STOCKHOLM, SWEDEN.

Murray system is handicapped by not printing direct at the receiving station. This is an entire misapprehension. There are just as great advantages in not printing direct at the receiving station as there are in not transmitting direct at the sending station. To give only one illustration of this fact, there is no delay on the line while the typewriter carriage is being run back for each new line or while a fresh telegraph blank is being inserted. There is also the great advantage, now about to be tried practically for the first time in Russia, that the received perforated tape, being identical in form with the transmitting tape, can be used for automatically retransmitting messages to their various destinations over different lines. In the case of the Russian trial of automatic retransmission the object is chiefly to get the highest possible speed over a very long and costly line, with the minimum number of repeating stations, the retransmitted signals being as perfect as the original signals and free from any of the clipping or deformation due to ordinary repeaters.

Brixey vs. Kerite.

The word "Kerite" has become invested with a peculiar meaning and significance, decidedly unique in the history of electrical device nomenclature. The combination of the names of "Brixey" and "Kerite" is a strong one, each suggesting the other, standing for all that is best in the telegraph field in insulated wires and cables, whether designed for aerial, underground or submarine purposes. The Kerite products also cover telephone, power, lighting and other fields. While the range indicated is a wide one, the high quality and durability of the output of the extensive Kerite plant, located at Seymour, Conn., has elevated all its products to the lofty measure of "standard." This pre-eminence has been fairly and conscientiously won in the many years devoted to high standard of excellence and improvement in manufacturing detail and gives the house to-day a commanding position in the trade. Kerite is an insulating material made under secret process, and for nearly fifty years has remained unquestioned in its integrity of action. During this period of half a century of continuous service, tests of the most rigid character, made under peculiar and trying conditions, have demonstrated beyond all question its desirability and adaptability for the purposes intended. Age does not impair its fine qualities, but rather does it tend to its betterment. As long ago as 1868, Prof. Morse, the inventor of the telegraph, impressed with the excellence of the then newly discovered compound, "Kerite," took occasion to write approvingly of it to Austin G. Day, the inventor. This letter, coming from such an eminent source, embodied in the advertisement of Mr. Brixey, printed on another page, will be read with interest. Events have since shown that Prof. Morse's approval of Kerite was another example of his keen insight and good judgment.

Mr. Day spent many years in tests and experiments in the endeavor to procure a compound which would withstand deteriorating influences and trying conditions. Para rubber, while being of the highest class for insulating purposes, was limited as to its natural life. Mr. Day sought a combination which would preserve the life of the virgin rubber and have of itself great life and durability. That his many years' search and labor were well spent has been amply demonstrated by the only real test, the test of time. Kerite insulated wires and cable have done continuous service for the past forty to fifty years and there are in operation to-day many such cables that have given the highest service for this long period of time.

Orders for books on telegraphy, wireless telegraphy, telephony, all electrical subjects, and for cable codes, will be filled by TELEGRAPH AGE on the day of receipt.

No up-to-date telegrapher can afford to be without TELEGRAPH AGE. It furnishes him with information essential to his welfare. Send for a sample copy.

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The Vailograph.

This instrument is an improved vibrator weighing only two and one-half ounces, and is the only sending machine in the world which is applied directly to and worked by the old Morse key. It is made of brass, nickelplated and will last a life time. F. T. Vail, the inventor, formerly chief operator of the "Soo" telegraph service, at Minneapolis, saw the difficulty after years of experience at the key. It was that the dots played havoc with the delicately trained arm and wrist of the operator. It was no strain to make the deliberate dashes, but inasmuch as it took as many motions to make a dot as to make a dash, and dots preponderate in the Morse alphabet, the problem was to eliminate the strain of dot making. This he has accomplished in his sending machine by a little spring hung and weighted like a pendulum. It is attached to the regular Morse key in such a way that the ordinary contact makes the dashes, while, if dots are required, one motion of the key will set the weighted spring vibrating and it will rattle off as many dots as the character requires. This vibration is produced by a lever situated by the bar of the key, and inasmuch as the platinum contact point is attached directly to the spring, the contact is positive instead of indirectly,

THE VAILOGRAPH.

through another spring, as in some other sending devices. The main features of the sender, however, are its compactness and the fact that it is operated by the same motion as the old key. The advertisement of the Vailograph appears elsewhere in this issue.

FRANK T. VAIL,
of Minneapolis, Minn.

Frank Tracy Vail, president of the Vailograph Company is a telegrapher who, when active in the service, acquired a fine reputation, both as an operator of ability and as one possessing close acquaintance with the technicalities of the telegraph. He was born at Cedar Falls, Iowa, in 1869, and after entering the telegraph service on August 1, 1884, rose to be manager of the local office of the Western Union Telegraph Company. His telegraph experience has been gained mainly in the railroad service, and he has held various positions on different lines of railway. For the past fifteen years he has been with the Soo line at Minneapolis, more latterly as chief operator in the general office.

Superintendent Jesse Hargrave, of the Postal Telegraph-Cable Company, as an Author.

Jesse Hargrave, until lately assistant electrical engineer of the Postal Telegraph-Cable Company, New York, and now one of its superintendents, recently essayed the role of author with distinct success. To the new and revised edition of "Electrical Instruments and Testing," by Norman H. Schneider, just out, which treats of the use of the voltmeter, ammeter, galvanometer, potentiometer, ohmmeter, the Wheatstone bridge and the standard portable testing sets, Mr. Hargrave has contributed important matter which appears in the two concluding chapters, one treating on testing telegraph wires and cables, the other in locating faults in telegraph and telephone wires and cables, in which valuable tables are given. Mr. Hargrave's treatment of his subject has been especially well considered and embodies the best thought of this well-known telegraph authority who has devoted all the years of his business life to the telegraph service. Mr. Hargrave's experience in the class of tests he describes, respecting which telegraph people desire specifie information, well qualifies him to prepare the descriptive matter he has so carefully done in this volume. There is, in fact, no other book that treats so comprehensively and with so much elaboration of detail the subjects he discusses. Mr. Hargrave's knowledge of the requirements necessary to fit a man for responsible service in telegraph employ has prompted him to furnish all necessary information to meet any probable emergency that is likely to arise in wire and cable testing.

The volume embraces 256 pages, has 133 illustrations and diagrams. Price, cloth, $1; in full limp leather, $2. Address all orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Telegraph Age constitutes a "school of instruction" to every would-be telegrapher. It is accurate and authoritative and worth many times the price of subscription ($1.50) to any who would inform themselves respecting the telegraph.

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Messages of the Wires.

"Dot dash dash dot dot dot dash"—day in and day out, thus runs the song of the wire in the big telegraph stations of America. Its ceaseless hum tells the human interest stories of life. The electric spark vitalizes the affairs of men. It lays bare the innermost secrets of the soul. These secrets are held inviolate by the telegrapher. Night and day, Sundays and holidays, sunshine or storm, he must sit at his post of duty, the confidant of the world.

Not excepting doctors and clergymen, there is probably no class of persons in the world that come into more direct contact with the family affairs of men and women of to-day than the operators in the big telegraph stations. The "click, click" of the telegraph instrument rehearses the joys and sorrows of humanity. If a son is dying in a distant country, the message of grief is wired to the mother on the instant. A child is born to royalty and the four quarters of the world are cognizant.

Cupid is often at the telegraph key and the wires hum with words that bring happiness to the expectant lover. When a bank president absconds with thousands of dollars, the telegrapher speeds the startling news to the proper authorities and the army of depositors soon knows the fate of its hard-earned savings. Threats, upbraidings, love ditties, successful achievements, disaster and joyful anticipations are all brought first to the man at the electric key. He is the confidant of humanity upon whose shoulders are thrust the pleasures and tribulations of man.

If the telegraph operator were paid pro rata, in comparison with the physician, for the stories of the hearthside, the passions and tears that make up the lot of every human life, he would be the envy of a Rockefeller or a Morgan. The family doctor is acquainted only with the afflictions of the world. His sphere of activity is limited to disease and death. He is an eye-witness of only one side of life's great drama. It is the grief-stricken side, where he must put on the mask of cheerfulness and buoyancy or else fall by the wayside, a professional failure.

But not so with the man at the telegraph key. He gets the spice with the wormwood, the nectar with the gall, the laughable with the pathetic. The variety of his experiences when it comes to feel the pulse of humanity, is as far apart as the Polar seas. Every phase of life, not alone the pathetic, through his deft fingers, is devoured by the electric current and swallowed up to be ever afterward forgotten. At one moment the operator is whirled to almost ecstatic heights himself by the good news which some orphan child, perhaps, is going to receive; news that very possibly will change the course of a life that conditions had previously made hardly worth the living. Or again, the man at the key is thrilled with excitement as he reads from the instrument the tidings of imminent war between nations and in the next second may be telling to the world the story of an assassination. Not only do the heart beats of the private citizen first reach the telegrapher, but he also feels the pulse of a nation.

And the man at the wire is faithful to his trust. He is instructed to forget his tales of happiness and woe when he arises from his day of labor. The intimate secrets of family life which spell ruin to so many, are locked in the breast of the telegrapher, never to be reawakened. Names must be forgotten on the instant that the wire hurries them on their journey. No messenger of a king, or courier on the field of battle should be more faithful to his trust, a trust which guards the innermost secrets of mankind. Grown accustomed to the woes and afflictions of men and women, the operator's heart is seldom ruffled. Day in and day out, he sits bent over the electric spark and performs his duty regardless of the tears that are shed and the homes that are shattered by his messages of pathos. Then again, a smile wreathes his face as a humorous ditty by some lovesick maiden is thrust before him.

As in every walk of life, there is a comedy phase to the daily routine of the spark manipulator. His rigid imperturbability is frequently shaken by a ten-word message that flavors of the burlesque. Some fond wife chiding her "hubby" for a few hours' neglect; the sum of twenty-five cents invested for the privilege of sending kisses in the shape of ink stains on the telegraph blank; a threat of death if a person does not show up at a selected trysting-place within a certain hour; the driving home of a bargain which will net some millionaire Jew the paltry profit of six cents—all these and a thousand more go to make the lot of the telegrapher, on the whole, a happy one. The fun is thereby mixed with the gloom, and in the end his ledger of work is balanced evenly.

These are the factors that go to make the life of an operator in either the Postal or the Western Union telegraph offices to-day wider in scope, although less remunerative than that of the doctor, the lawyer, or even the clergyman.

Aside from the human interest element there is a much broader field of activity which his labors embrace. This is the world of business. Here one man meets another on his own stamping ground and it is a fight to the finish for supremacy. This battle of intellects waged in the stock exchange, in the public mart and in the great trade centers of America, is reflected in the telegraph office. A man in the Chicago wheat pit secures a "corner" on the market. Hardly do the speculators themselves know what has happened before the financial circles in New York, London and Paris are aware of it. And how? By the "click" of the telegraph. A panic seizes Wall Street, and that dire word is scarcely breathed by the giants of the "Street," when the telegrapher is pushing the calamitous news from Maine to California. If the operator is entrusted with important secrets in the life of the home, the business secrets that are told to the electric spark

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from one great magnate to another, via the man at the board, are weighty indeed.

In this way, the telegrapher comes to know the solution of many deep problems which confront the captains of industry, problems, the working out of which has made America the leading power among the nations of the earth. More than once in the history of the United States, the dot and dash reeled off by the operator at his post, has averted disaster in the world of finance. Those messages are filed away in the archives of the big telegraph companies, never to be resurrected, and the knowledge of their contents is known only to the telegrapher who sent them.

The appearance of the messenger boy at the door of the home generally strikes terror to the heart of the housewife. A shudder of fear invariably creeps over the recipient of the telegraph message. It has come to mean a foreboding of ill. And this feeling is not based on any superstition, but on the contents of a great majority of the telegrams that are filed in the telegraph stations. A good proportion of the words that keep the wires busy are of the dark side of life or if not actually the forerunners of sorrow, they oftentimes are of an intimidating nature.

But it is when Cupid gets in his deadly work that the telegrapher chuckles to himself. Some of the brief epistles wired from one ardent lover to his sweetheart are of the most mushy character imaginable. They flavor of the ridiculous in many cases and even make the wires shake with mirth. —Springfield Union.

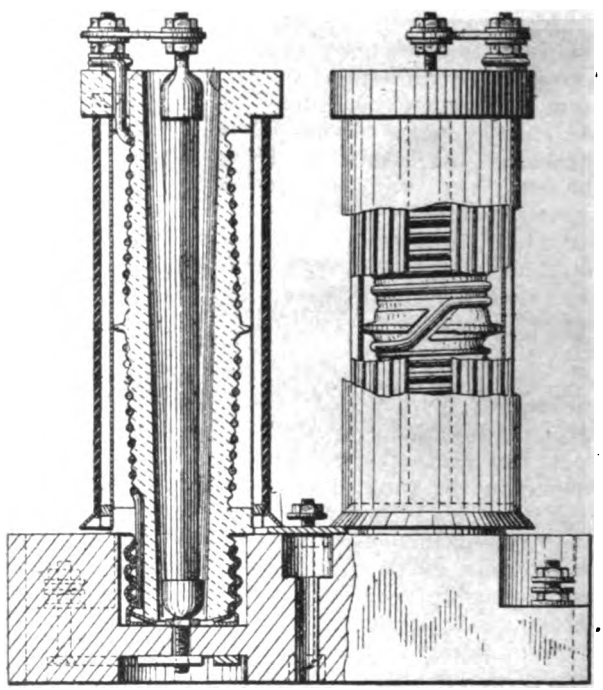
Type "D" Argus Lightning Arrester.

The "Argus" lightning arrester has long been a prominent feature in the products manufactured by Foote, Pierson and Company of 160-162 Duane street, New York. In the new type "D", patented June 18, 1907, of which a line drawing showing detail of construction is herewith presented, new in design, a new principle is embodied, which insures superior results. This instrument contains all the good qualities which have made other types popular, and provides in addition a number of improvements. It has a porcelain cylinder with a taper core which increases gradually from each end toward the center, while around this core is wound a coil of copper wire in a spiral groove. The coil is enclosed in a corrugated copper casing designed for connection with the ground, by which means the sparking distance between the coil and the copper casing is graduated so that as a storm approaches, the first or outside convolutions of the coil will discharge, and as the storm advances nearer, the successive convolutions will take part in the discharge, thereby greatly increasing the capacity.

The idea of the taper core from both ends toward the center, is to insure the placing of the shortest sparking distance to the line. It is preferable to connect line to the arrester and fuse to the instruments. This arrangement also provides for way stations, where storms are liable to approach from either direction. The arrester has a hollow core in which an enclosed fuse is placed to protect against crosses with high tension circuits.

The porcelain base is arranged for either one or two arresters and is provided with a metal strip having a binding post terminal to which the ground wire is connected. The corrugated copper casing which surrounds the arrester coil, has a wide flange at the bottom which makes contact with this ground strip when placed in position.

It is a well known and established fact, that lightning discharges can be dissipated and broken up much more effectively from sharp



LINE DRAWING, TYPE "D," ARGUS LIGHTNING ARRESTER.

edges or points than from flat surfaces, and this principle is applied to the type "D" arrester in a most efficient manner, the arrester coil being surrounded by the sharp edges of the corrugated casing.

The porcelain base has projections and depressions which interlock one with the other, so that when a number of arresters are placed together they present a solid wall. This arrangement is also very valuable where space is limited, enabling thirty arresters to be placed in a space one foot square.

If you wish to know all about the instruments you work, invest $1.50 in a copy of Jones' diagrams.

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Preservative Treatment of Poles by the Open-Tank Process.

BY D. A. ROCKWELL.

In the work which has been done in connection with the preservative treatment of telegraph, telephone and transmission line poles it has been considered that, compared with other preservatives, dead oil of coal tar is the most efficient and the most economical in the long run. Carbolineum, which is in reality a refined dead oil of coal tar, may have a limited use.

Timber may be treated with dead oil of coal tar by three methods, namely, the closed-cylinder method, the open-tank method, and the brush method. The relative efficacies of the methods are undoubtedly in the order stated.

The open-tank method differs from the closed-cylinder process in that tanks or vats, which are open to the air, are employed. The open-tank process, in that it does not necessitate the use of expensive cylinders and auxiliary apparatus, promises to effect, by reduction of plant costs, considerable economies in the preservative treatment of timber. Another advantage offered in the case of poles is that the portion of the pole subject to the maximum decaying action, that is, the butt end, can be selectively treated. This procedure results in a considerable saving of preservative compound. The possibility of treating poles at a comparatively small cost so as to obtain thereby an increased life of several years should insure a considerable field for the application of the open-tank process.

There are two distinct methods of carrying out the open-tank process of treatment, the single-tank method and the double-tank method.

In this method, the timber under treatment is placed in the tank and covered with dead oil of coal tar, means being taken if necessary to prevent the timber from floating. Heat is applied to the tank, either by a fire built beneath the tank, or, preferably, from the standpoint of fire hazard, by steam coils placed within the tank, and the oil maintained at a temperature of from, say, 212 deg. F. to 230 deg. F., for several hours, depending on the size and character of the timber. As a result of this heating, the air and moisture are expelled from the wood structure, which fact is indicated by a seeming ebullition of the oil.

This method may be carried out in two different ways: a. With change of oil; b. without change of oil.

When the heating process has been sufficiently prolonged, the hot oil can be run out of the treating tank into the emptying tank, method a, and the treating tank quickly refilled with cool oil from the storage tank. The oil storage tanks and connecting pipes should be so proportioned that the emptying and refilling process can be carried out in a short time, as an exposure of the treated surface to the air between the hot and cool oil baths is liable to react on the oil penetration. The timber is allowed to remain in the cool oil bath for an interval of time such as experience shows sufficient to ensure the desired penetration.

Instead of emptying the treating tank between the hot and cool baths, the valves of the connecting pipes may be so arranged that the oil level in the treating tank is maintained substantially constant during the change of oil. If the supply tanks are of sufficient size, the temperature of the oil in the treating tank will be considerably lowered by this procedure.

In method b the heat supply is shut off at the end of the heating interval, and the oil is allowed to cool by atmospheric radiation. The results obtained by this method are essentially the same as with a change of oil. This method has been successfully followed in the experimental treatment of cedar and chestnut poles, and Norway pine cross-arms.

Method b would probably require a longer time for treatment than method a owing to the slower process of oil cooling. However, if it is desired to make only one run per tank per day, that is, heating during the daytime and allowing the poles to remain in the cool or cooling oil during the night, then method b offers certain economies in plant cost. As it is not necessary to empty the treating tank in order to recharge with poles, the emptying tank is not required. The storage tank can be used in method b if it is desired to store considerable oil at the treating plant. Such a tank greatly facilitates the handling of the oil, as otherwise it is necessary to fill the treating tank from barrels.

DOUBLE-TANK METHOD.

In this method two tanks are provided, one for the hot bath and one for the cool bath. After the timber has been in the hot bath for a sufficient length of time, it is transferred to the cool bath and allowed to remain therein for the necessary time. The question of the exposure of the treated surface enters, however, and, as several minutes might be required to transfer a pole from the hot to the cool bath, it is not felt that the method should be carried out in practice until further experimentation has determined what exposure of the treated surface, between the hot and cool baths, can be made without reacting on the depth of oil penetration into the wood structure.

A disadvantage of the method is the increased cost of handling incident to the transfer of the poles from the hot to the cool oil tanks. This method presents the advantage, however, that the treatments can be carried on without interruption, as both the hot and the cool tanks can be kept filled with poles.

Experiments made in 1905 by the Forest Service showed that penetrations through the sap wood could be obtained on partially seasoned and seasoned cedar and chestnut poles. The results on green poles were not as satisfactory, the penetrations being somewhat irregular. Winter cut poles, after the outer bark is removed, have

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an almost impervious layer of inner bark which adheres to the green wood, but wherever this inner bark layer is removed, the oil penetrates the sap wood. It is probable that, by shaving the butts of green poles, good penetrations could be obtained, but it is considered advisable at present to limit the open-tank treatment to seasoned or partially seasoned poles, by which it is established that good results can be obtained.

In connection with the treatment of seasoned cedar and chestnut poles, it is fair to assume that a thirty-foot pole will on the average absorb at least fifty pounds (about six gallons) of dead oil of coal tar.

Seasoned loblolly pine can be treated easily by the open-tank method. This timber seasons in a few months in the South, and the treatment of loblolly pine poles can be carried out without an undue holding for seasoning.

About five thousand seasoned Norway pine cross-arms have been treated by the open-tank process with excellent results. An average absorption of about twelve pounds of dead oil of coal tar per cross-arm was obtained.

PLANT REQUIREMENTS.

In the design and construction of open-tank treating plants, it is necessary to consider the following factors as reacting on the design: 1. Location of the plant and accessory apparatus as affecting the ease and economy of handling poles and oil. 2. Reduction of heat radiating surfaces to a minimum. 3. Means of keeping timber below the oil surface. The last factor does not enter into the pole treatment, but in the treatment of seasoned cross-arms; for example, it has been found necessary to adopt means to keep the arms submerged at the beginning of the treatment.

The effect of a proposed treating plant upon the insurance of the surrounding property should be ascertained before a definite location is selected. In plants heated by steam the fire hazard should be small if the boiler is somewhat removed from the storage and treating tanks. Dead oil of coal tar at ordinary temperatures does not take fire easily, but after catching fire it burns fiercely; such a fire is best controlled by throwing sand upon it.

The apparatus necessary for the operation of method b is a treating tank with steam heating coils, a source of steam supply and a derrick for handling poles and oil barrels.

Method a requires, in addition to this apparatus, a storage tank for dead oil of coal tar, an emptying tank, and a pump for the transfer of oil from the emptying tank to the storage tank, and from the tank-car to the storage tank.

The size of the treating tank is dependent primarily upon the number of poles which it is desired to treat per charge, and also to some extent upon the source of steam supply for heating. The depth of the tank is controlled by the longest poles which are to be treated at the plant. The greater the height of the tank above the ground level, the greater the difficulty in loading and unloading the tank. A tank eight feet deep will treat the butts of poles up to forty feet in length, and a tank nine feet deep up to fifty feet. Occasional poles of greater length than these could be treated by placing them diagonally in the tank and regulating the oil level to the proper height on the pole. To facilitate the handling of poles, the tank should be set as much below the ground level as is compatible with the requirements for steam circulation. A one-quarter inch steel tank with lap-riveted joints, and properly braced, should be satisfactory.

The oil in the treating tank should be heated by means of steam pipes arranged on the bottom of the tank. The heating pipes may be in the form of a return-bend coil, or, preferably, of a coil made up of branch T's. The latter form would provide a better steam circulation. Although there is very little information relative to the heating of open-tanks filled with dead oil of coal tar, it is estimated, on the basis of theoretical consideration, that, if steam is supplied at a pressure of one hundred pounds per square inch, a steam pipe area of 0.075 square foot per cubic foot of oil will raise the temperature of the oil at a rate of between one degree Fahrenheit and two degrees Fahrenheit per minute. The steam coils should be protected from possible injury, as the dropping of poles upon them, by being coiled about I-beams or rails, the protection being placed so that the smallest poles to be treated will not pass between the beams or rails and strike the coils.

If the bottom of the tank is located lower than the steam boiler, it will be necessary to install a condensing steam trap, condensing well, and an injector or circulation pump, if it is desired to return the condenser water to the boiler.

The steam supply should, if possible, be sufficient to raise the temperature of the oil to 220 degrees Fahrenheit in from two to three hours, which would correspond to a temperature rise of the oil of from one degree Fahrenheit to two degrees Fahrenheit per minute. Assuming a combustion of about eight pounds of coal per square foot of grate surface and an evaporation of eight pounds of water per pound of coal, it is estimated that a grate surface of about 0.035 square foot per cubic foot of oil will be ample. These assumptions are based on the use of vertical boilers of the type used with hoisting engines and a medium efficiency of coal combustion.

In calculating the requisite steam pipe and grate surfaces for any treating tank, it would undoubtedly suffice to assume the oil volume as one-half of the tank space at the highest oil level to be maintained in the tank. It may be considered, for purposes of calculation, that the oil will be heated before the poles are placed in the tank. Even if the poles are in the oil during the initial heating process, the oil will probably absorb the

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greater portion of the heat owing to the poor conductivity of wood. After the oil has reached the maximum temperature, sufficient heat must be supplied to overcome the loss of radiation and the heat absorbed by the wood.

The supply of steam can, if desired, be controlled by means of a thermostatic regulator set to maintain a maximum temperature of two hundred and twenty degrees Fahrenheit. If the treating plant is situated near a steam plant of considerable size, it will probably be more economical to obtain the steam from that plant in preference to installing a special boiler for heating purposes. As the steam is required at the maximum rate during only the heating of the oil, it would undoubtedly be possible to furnish from one small boiler steam necessary for heating the storage tanks, tank cars, circulation and oil pumps, and for a steam winch in connection with the derrick for handling the poles.

The oil storage tank for large plants should have a volume of at least 25,000 gallons; that is, somewhat in excess of two oil-tank cars. The tank should be provided with steam heating coils in order to maintain the temperature of the oil above the temperature of solidification. The storage tank should be placed at a height sufficient to enable the filling of the treating tank by gravity. The connecting pipe between the storage and treating tank should be at least ten inches in diameter and controlled by a valve. The storage tank should be equipped with a float gauge to indicate the height of oil in the tank.

The emptying tank should be placed underground so that the oil will flow into it from the treating tank by gravity, and should be of somewhat greater volume than the treating tank. The connecting pipe should be at least as great in diameter as the pipe between the storage and treating tanks.

The treating tank should also be joined to the emptying tank by means of an overflow pipe connected at different heights with the treating tank. By opening proper valves, the oil level in the treating tank can be maintained at the desired height. It will not be necessary to place heating coils in this tank if care is taken to pump the oil back into the storage tank before it has cooled to the temperature of solidification. The tank should be provided with a float gauge as an indicator of the depth of oil in the tank.

A steam-driven pump should be provided for transferring the oil from the emptying tank to the storage tank. The pump would also be used when filling the storage tank from tank cars.

A derrick should be provided in order to facilitate the transfer of the poles into and from the treating tank. The derrick could, if desired, be operated by a hoisting engine, the steam being supplied from the heating boiler.—Electrical World.

The First Telegraphic Train Order.

Writing a brief history of the telegraph for the Northwestern Bulletin, published by the Chicago and Northwestern Railway, G. W. Dailey, superintendent of telegraph, a close student of telegraphy, gives credit to the Erie as being the first road to use the telegraph wire, in train service. In his carefully prepared article, which asserts that the Chicago and Northwestern was the first railroad in the West to handle trains by telegraph, he says:

"The telegraph was first used for handling trains by the Erie Railroad, and the first train order was issued in 1846 at Turner, N. Y., a station on that railway. The circumstances surrounding its first use for that purpose are as follows:

"The New York and Erie Railroad, whose eastern terminal at that time was at Piermont, N. Y., on the Hudson River, had a telegraph wire running into several of its most important stations which was known as the 'Ezra Cornell Line.' This telegraph line was built on a highway paralleling the Erie Railroad, and as a matter of convenience the railroad company's agents attended to the commercial telegraph business.

"One day Charles Minot, then general superintendent of the New York and Erie Railroad, was going west on train No. 1, which was scheduled to meet train No. 2, eastbound, at Turner, N. Y. After waiting nearly an hour at Turner for train No. 2, Mr. Minot stepped into the telegraph office and requested the operator to call up Goshen, N. Y., and ask the operator if train No. 2 had passed there. On receiving a negative reply, Mr. Minot sent the following telegram to the Erie Railroad agent at Goshen: 'Hold all trains bound east until I arrive there on train No. 1. Do you understand? Answer.' In a few minutes a reply was received from the agent at Goshen saying: 'I understand I am to hold all eastbound trains at Goshen until you arrive here on train 1, and will do so.' Mr. Minot then wrote out an order to the conductor and engineer of train No. 1 at Turner as follows: 'Run to Goshen regardless of train No. 2.' signed Charles Minot, general superintendent. The engineer of train 1 refused to do it until Mr. Minot said he would ride on the engine with him. The run was made with safety and within a few days thereafter the 31 and 32 orders were regularly established on the Erie and quickly followed by other roads.

"This is a good illustration of the difficulties and opposition usually encountered in introducing new methods of doing things. Since that time the use of the telegraph by railroads has grown by leaps and bounds until at present a railway telegraph department ranks high in usefulness and importance and is a very necessary part of the business machine."

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$1.50 a year.

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I T E

DAYS KERITE

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1908

"Its quality or rather property of resisting the deteriorating causes which tend to destroy sooner or later the insulation by gutta percha, or caoutchouc, makes it an invaluable discovery in aid of telegraphic extension. The test to which it has been submitted and by which it has been proved to resist the deteriorating effects of the ozone of the atmosphere appear perfectly satisfactory, and I therefore most cheerfully and cordially join with those who have tested its efficiency in congratulating you on your success in introducing so valuable an aid to the telegraphic enterprise of the world."

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DAYS KERITE

I T E

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Letters From Our Agents.

PHILADELPHIA, WESTERN UNION.

Mr. J. B. Fleishman, aged fifty-five years, formerly employed in this office, died on December 17 from a stroke of paralysis. He left the service in 1883, and had been in the brokerage business since. He at one time accumulated considerable wealth, which he afterward lost, but was again on the fair road to fortune.

Miss Fannie Schott, who has just returned from Atlanta, where recently she performed valuable service, is ill with a very severe attack of grip.

Mr. O. M. Pennypacker, wire chief, recently made an enjoyable trip to New York of a few days.

Mr. George Kauffman of this office was married on December 18.

Messrs. Christie and Shugar have returned from Chicago, where they had gone to assist during the late troubles. Messrs. Benckert, Berger and Wilde, Pittsburg, on a like errand, are also at their desks again.

Other absentees despatched on similar missions, including Messrs. Wood, Boland and Maize, who went to Atlanta, Ga., and Messrs. C. B. Wood and H. V. Hudgins, who were assigned to Jacksonville, Fla., are also back in their accustomed places.

Mr. Landon, who went to Atlanta, temporarily, has located at New Orleans for the winter.

Miss O'Donnell, who went to Savannah lately, has decided to locate in that city permanently.

Joseph T. Wilde, one of the wire chiefs of this office, fell down the stairs at his home in Merchantville, and sustained a very severe shock, which laid him up for a week.

Among late visitors to this office were Mr. Charles E. Sawtelle, formerly of this office, and now manager for the Postal company at Cincinnati, and Richard O'Brien, assistant superintendent at Scranton, Pa. Mr. O'Brien has just been elected a director of the Bell Telephone Company of Philadelphia.

Another visitor was William Ettinger, of Jersey City, division operator, of the New York division, Pennsylvania Railroad.

NEW YORK, POSTAL.

Merry Christmas and a Happy New Year was rendered "Happy New York" by a few of the operators who didn't insist that "that's the way he sent it," but acknowledged they made it New York by force of habit.

John H. Twyford has been appointed traffic chief in the Rowland department. The Rowland machines are now being operated to Chicago, Philadelphia, Boston and various other points. Several thousand messages daily are handled on the Rowland machines.

John J. Deffley, aged forty-six years, who worked for this company about ten or twelve years recently as manager of the Herald telegraph department, night, died suddenly of pneumonia. His many friends will be shocked to learn of his sudden taking off.

Considerable activity was shown recently when the operators began to fill out their applications for membership in the Postal Telegraph Employees' Association. Nearly all have joined by this time. The president of the association, S. B. Haig, is well known, having served as general traffic chief in the operating room.

It is observed that a great many star operators are employed among the present force.

Typewriters—all makes and prices. Typewriter ribbons, dozen or single. Typewriter and carbon papers, etc.: "Everything for the typewriter." Vibroplex $7.50; Phillips Code, postage prepaid, $1; Telegraphers' Journal, Railroad Telegrapher to home address, $1 yearly. Postage stamps accepted for typwriter sundries. Booklet on request. Remit by post office or express order. Daniel A. Mahoney, 345 Broadway, New York.

OTHER NEW YORK NEWS.

The regular meeting of the Electric Building Loan and Savings Association for the nomination of trustees was held in the office of the corporation at 253 Broadway, New York, December 18, when the following names were placed in nomination for official positions: J. J. Whalen, president; James R. Beard, vice-president; E. S. Butterfield, treasurer; Edwin F. Howell, secretary; John B. Sabine and Alexander J. Schem, counsel and attorneys. The following were nominated as directors: Edward Reynolds, M. J. O'Leary, W. H. Jackson, Eugene P. Tully, J. B. Taltavall, M. W. Rayens, T. E. Fleming, M. M. Davis, F. C. Leubuscher, G. W. Blanchard, G. H. Schnitgen, C. F. Leonard, M. S. Cohen, P. O. Purcell and J. T. Mulhall.

The annual meeting of the corporation will be held in the same place on January 10, 1908. Polls for the election of officers and directors will be open from 2 P. M. to 5 P. M.

The regular meeting of the Serial Building Loan and Savings Institution for the nomination of officers was held in the office of the corporation at 195 Broadway, New York, on December 17. The nominations were: J. C. Barclay, president; James R. Beard, vice-president; E. S. Butterfield, treasurer; E. F. Howell, secretary; J. B. Sabine and Alexander J. Schem, attorneys. Directors, F. J. Scherrer, D. B. Mitchell, J. B. Taltavall, T. A. McCammon, M. J. O'Leary, W. H. Jackson, J. F. Nathan, G. H. Schnitgen, M. S. Cohen, J. A. Hill, M. W. Rayens, T. A. Brooks, E. E. Brannin, G. W. Blanchard, F. C. Leubuscher, J. T. Laidlaw, J. T. Mulhall, W. J. Quinn and S. S. Williams.

The annual meeting of this corporation will be held in the same place on Tuesday, January 14, 1908.

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Captain W. H. Allington sailed on the steamer "Colon" for the Isthmus on December 24, on business for the company he represents. He expects to return within thirty days.

The New York Telegraphers' Aid Society makes their statement for the quarter ending September 6, 1907, as follows:

Balance on hand June 6, 1907		$20,172.64
Receipts		1,497.50
Total		$21,670.14
Disbursements.		
Sick benefits	$1,020.71	
Death benefits	400.00	
Expenses	211.87	
		$1,632.58
Balance on hand Sept. 6, 1907		20,037.56
Total		$21,670.14
Summary.		
Receipts		$1,497.50
Disbursements		1,632.58
Loss for quarter		$135.08
RELIEF FUND.		
Balance on hand June 6, 1907		$4,085.00
Disbursements		77.00
Balance on hand Sept. 6, 1907		$4,008.00

Balances:

Aid Society	$20,037.56	On deposit	$23,827.06
Relief Fund	4,008.00	Cash on hand	218.50
Total	$24,045.56	Total	$24,045.56

J. H. Driscoll, W. T. Rogers, F. J. Nurnberg, Auditors.

Some Denver Telegraphers Enjoy a Picnic.

C. A. Parker, superintendent of telegraph of the Moffat road, Denver, Colo., gave a little picnic the other day, according to the Republican, of that city, to a number of his Denver telegraph friends. Among his guests were such well known telegraphers at that point as C. O. Blandin, assistant superintendent of the Western Union; G. F. Coit, "Old Farmer" Lawton and the "Farmer's" two boys.

The party was a merry one and enjoyed the ride over the Continental divide, down through Middle Park and Gore canon. They spent the night at the new town of Yarmony and found a bustling town, where no one has had time to erect more substantial houses than tents, which are proving very comfortable.

"Farmer" Lawton, who has been up over the Moffat line on numerous occasions in the summer time, looked very much like an Arctic explorer when he reached the Moffat depot. His wife had knit him an extra pair of wool socks and besides an overcoat that would worry an ordinary man to carry, he exhibited a buffalo robe, saved for just such an occasion. His sons were as warmly clad, but all agreed that their extra clothing was a burden to them, which they were only too glad to have checked back to Denver by express.

The "Farmer," who is considered an authority in Denver, says people make a mistake in waiting until the summer months to enjoy a ride over this scenic line, as a person really encounters the four seasons of the year by making the trip in **midwinter. The beautiful** fall weather Denver boasts of almost the entire winter is changed to real winter when one reaches Corona on the great Continental divide. The monster snowplows in operation is a most beautiful sight, but they are soon lost to view as the train glides down the smooth roadbed on the Pacific slope and ere long real spring weather is encountered. Even the wild flowers assist in making the scene perfect and pleasing to the eye. In many respects, this portion of the ride is very similar to that of passing down the Sierra Nevada mountains into the Sacramento valley of California. The only difference is, it requires hours of tiresome riding to notice the change in California, while the Moffat line gives practically the four seasons in less than twelve hours after leaving Denver.

Obituary.

Clarence Harris, an Associated Press operator who had been employed at both Schenectady and Rochester, died in Los Angeles, Cal., where he went previous to his death for the benefit of his health.

James H. Baker, aged fifty-three years, who has been identified with the telegraph department of the Missouri Pacific Railroad at Sedalia, Mo., for the past thirty-three years, died at Kansas City, Mo., on December 12.

Dr. Frank A. Howig, a telegraph operator in the early years of telegraphy and subsequently a lecturer, while still a young man, on the science of electromagnetism, died in Big Rapids, Mich., December 10, aged seventy-nine years. He had practiced medicine since 1858. Among his effects was found a memorandum which stated: "I was among the first public lecturers on the science of electro-magnetism and when only twenty years old delivered over eighty lectures in the State of New York and Canada on that subject, illustrating my remarks with practical applications which never failed to furnish a crowded house at all times and places."

The Cable.

Cable communications interrupted, December 27, 1907:

Venezuela	Jan. 12, 1906
Messages may be mailed from Curaçao or Trinidad.	
Island of Palma (Canaries)	July 12, 1906
Steamer from Teneriffe.	

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General Mention.

Mr. A. E. Littler, of Lincoln, Neb., has been appointed manager at Reno, Nev., vice T. H. Brown, resigned.

It is understood that Mr. G. M. Foote, for several years manager of the Postal telegraph office in Newport, R. I., will be promoted and transferred to Washington as traffic manager of the Postal office there.

The Western Union Telegraph Company is installing a new main office at Nashville, Tenn., under the direction of S. R. Crowder, electrician of the southern division. The entire equipment will be new, including the dynamo plant, tables, instruments, etc.

Henry E. West, cable engineer, Signal Corps, U. S. A., on cable ship "Cyrus W. Field," entered the telegraph service with the Western Union Telegraph Company, New York, October 10, 1883, resigning therefrom September 9, 1904, to accept his present position.

Charles Wise, for twenty-five years chief operator of the Western Union Telegraph Company, Evansville, Ind., died on December 23, 1907. He was fifty-five years of age. For two years he had been ill with tuberculosis, six months ago being compelled to relinquish his duties. Mr. Wise was born at Piqua, Ohio, and entered the service of the Western Union company at Indianapolis.

Charles M. Holmes, executive messenger, on duty in the suite of rooms attached to the president's office, of the Western Union Telegraph Company, New York, over which he stands a sort of guard, is one of the picturesque figures in the telegraph service. He performs an important mission in the line of his service, for no one enters the portal of the rooms where he is stationed without coming under his observation. It is safe to say that no cranks or otherwise objectionable persons evade his keen scrutiny. He has been identified with the offices in question for so long a period that his knowledge of "who's who" is intuitive. Mr. Holmes had an honorable record in the navy during the Civil War. The date of his connection with the company goes back almost forty years.

Telegraphers who would save their earnings would do well to inform themselves respecting the advantages to be derived in dealing with the Serial Building Loan and Savings Institution, 195 Broadway, New York. This institution was designed to promote the financial welfare of telegraphers, and this it has steadily accomplished during all the years of its opportunity, standing strong and steadfast with unimpaired credit.

Advertising will be accepted to appear in this column at the rate of three cents a word, estimating eight words to the line.

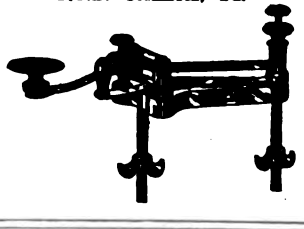
Will buy or sell, in one to five-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

Rubber Telegraph Key Knobs.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Leg Pattern $3.50
Legless Pattern 4.00
F.O.B. Columbia, Pa.



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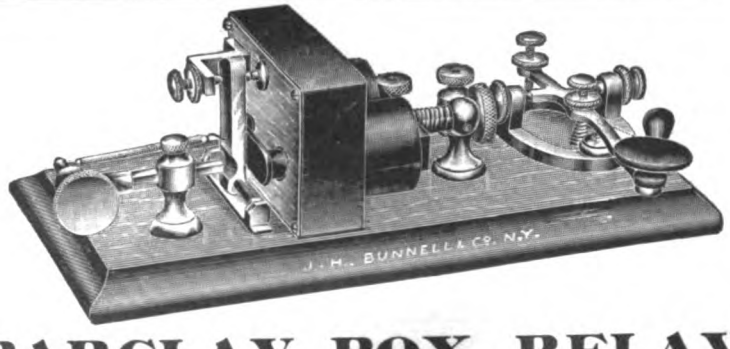

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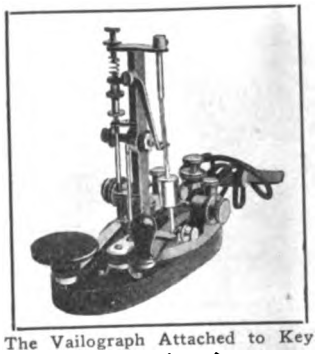

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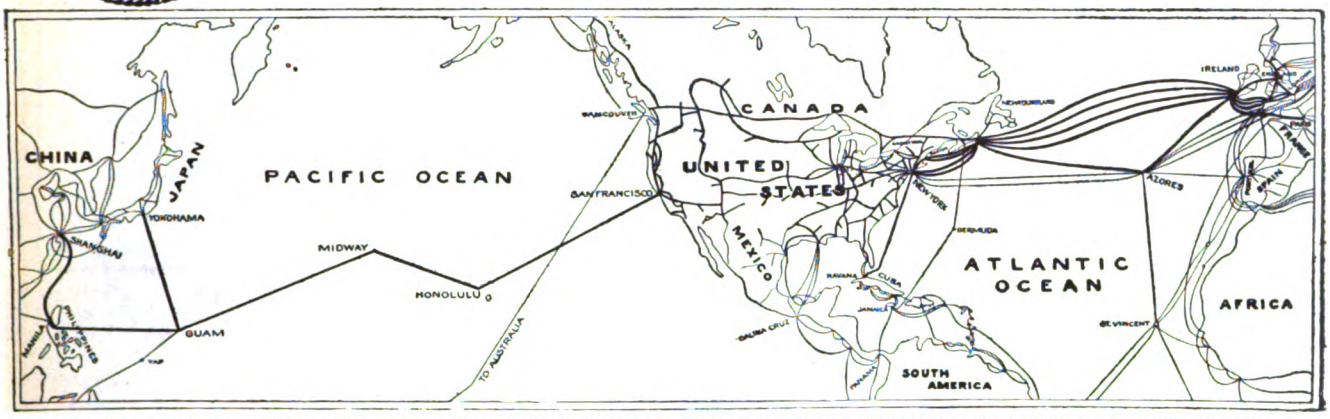

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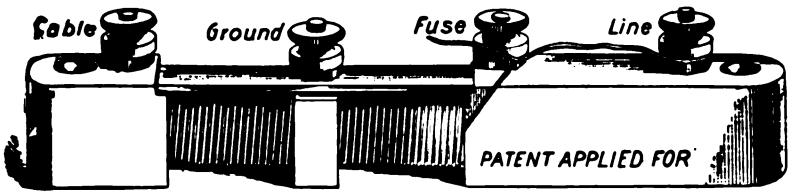

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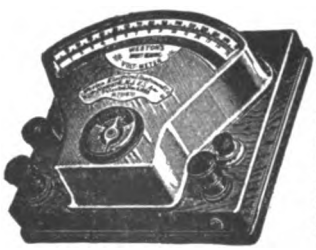

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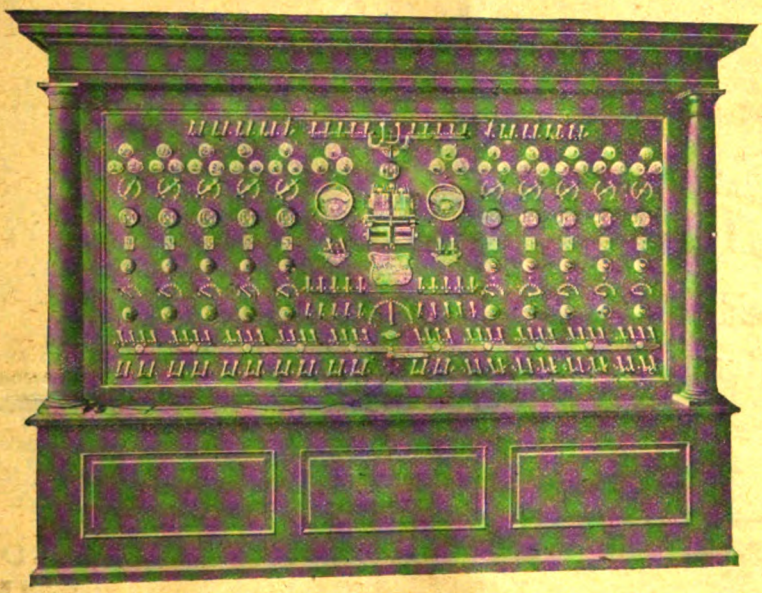

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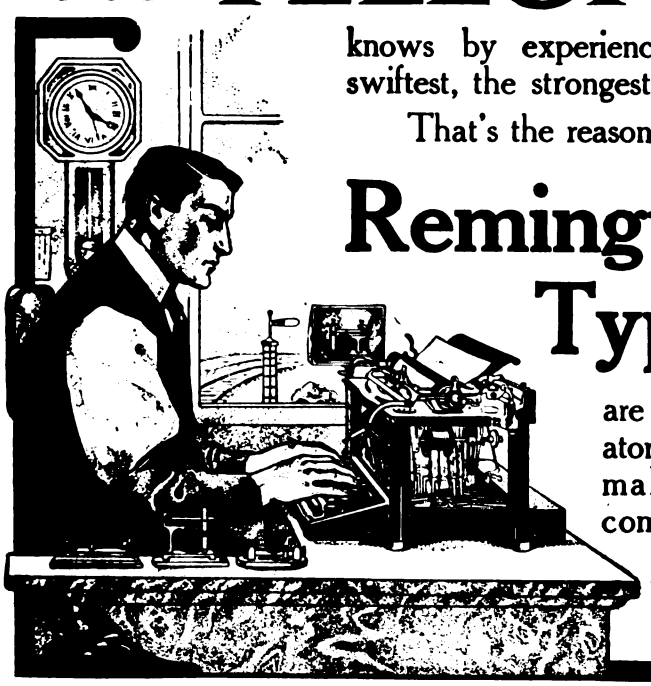

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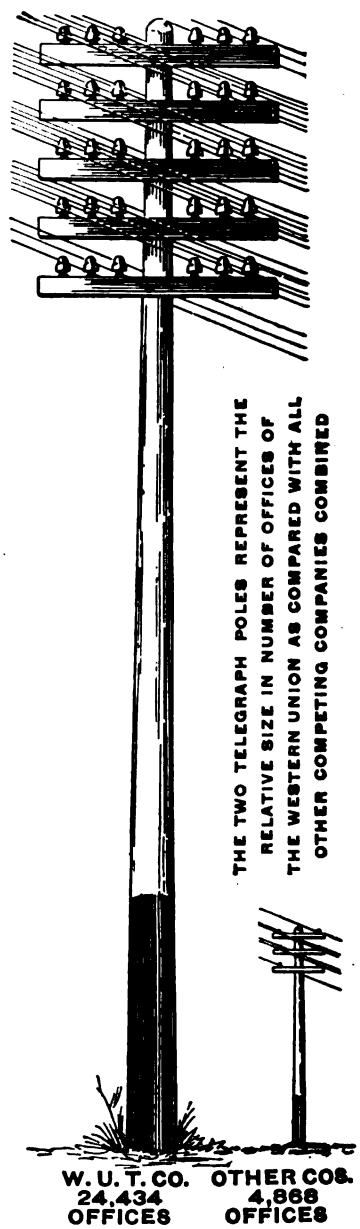

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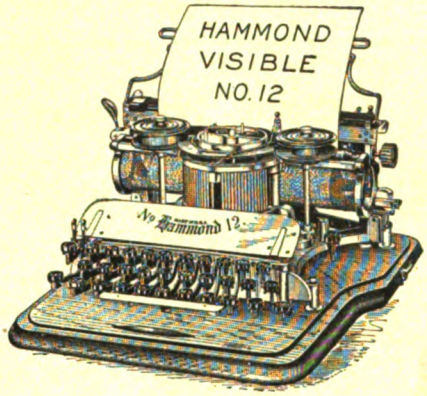

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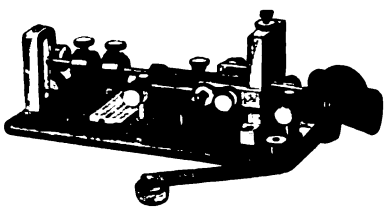

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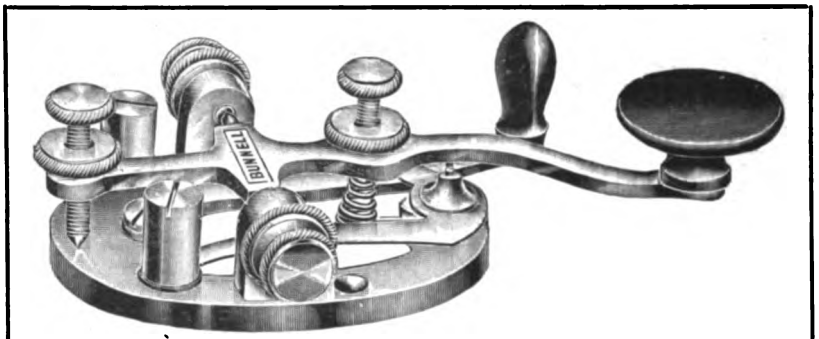

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How to Become a Wire Chief.

BY WILLIS H. JONES.

(Part 2.)

Having familiarized oneself to a great extent with a cursory glance of the various circuits, by means of the selfmade charts and notes suggested and shown in the preceding installment of this article, the newly appointed wire chief should then study closely the official chart which the general wire chief furnishes for the purpose of giving accurate information concerning each and every circuit.

As will be seen by a glance at this chart, Fig. A, the form and general features of which are shown in the accompanying diagram, the wires are all represented by straight lines with nothing to indicate the geographical direction they take except by noting the various stations in which the wire or wires are cut in. Such stations are indicated by a black dot placed opposite the stations. Where no dot appears opposite the name of a station or letter representing its call, the omission indicates that such wire or wires do not run through the switchboard there.

This card is very useful when testing for trouble, as it enables one to know at a glance which stations are available for the purpose of locating a fault, but it suggests no picture of the field to the mind. The latter is one of the essential qualifications of a good wire chief. He should be able, and usually is, to practically see the entire route of every circuit in his board from beginning to end without consulting his chart, hence the value of the individual homemade chart.

The next knowledge a beginner should acquire is that of the value of the respective wires. The chart may indicate that two or more wires go through the same stations and terminate at the same point, yet neither could be substituted satisfactorily for the other in many cases. Thus we may have wires No. 1 and No. 2 running side by side between two points. No. 1 is a railroad train wire and because all stations must have instru-

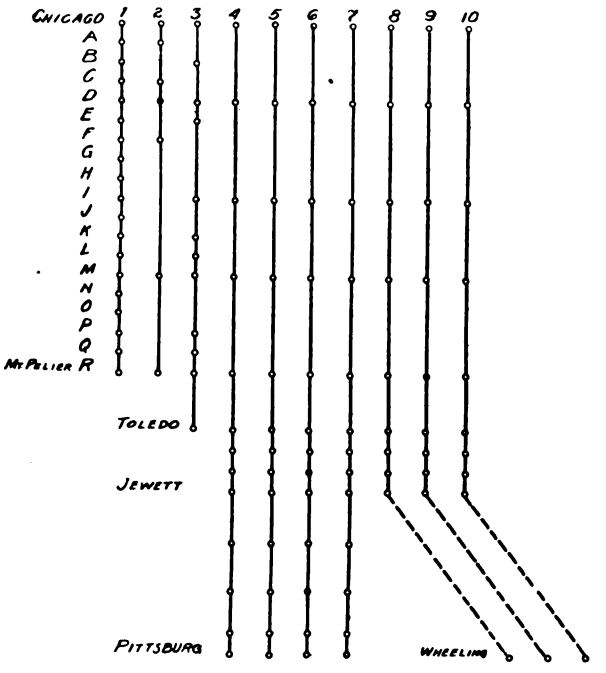

FIG. A.

ments cut in it is necessary to have a big copper wire for No. 1 in order to minimize the total resistance of the circuit. No. 2 may be an iron wire and assigned to a duplex circuit, but because none of the intermediate stations are cut in a smaller wire than No. 1 is permissible for duplex operation. But should all stations on No. 1 be told to cut in and use the small wire, No. 2, for the train wire, in case No. 1 was down, No. 2 would hardly be satisfactory, owing to its greater resistance. It is therefore absolutely necessary that the size and material composing each wire be known and kept constantly in mind. The wire

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chief should know that an iron wire of any given guage and length offers seven times as great resistance as it would had it been copper. He should, therefore, make a note of the guage and consistency of each wire in the board and thus know which are copper and iron and otherwise best suited for a given purpose.

The guages used for telegraph circuits are usually 4, 6 and 8 in iron, and 10, 11 and 12 for copper. The resistance in ohms per mile is practically the real measure of their value, other conditions being equal. A rough comparison of iron and the copper wires shows that a No. 4 guage iron wire of a given length is approximately of the same resistance as a 12 guage copper of the same length; a 6 guage iron and a 14 guage copper, and an 8 guage iron and 16 copper pair in the same manner, where the B. & S. or American guage is in vogue. Nearly all text-books on electricity contain tables of reference in regard to the guages and capacities of telegraph circuits and should be studied with care.

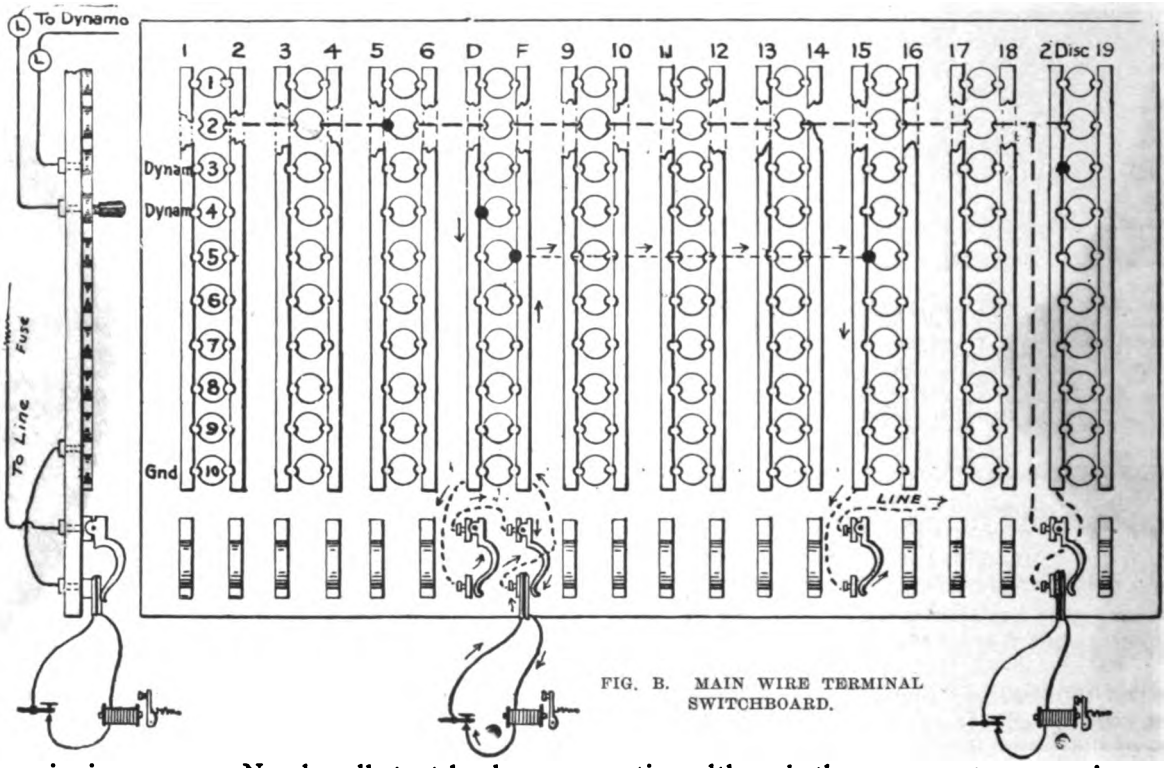

FIG. B. MAIN WIRE TERMINAL SWITCHBOARD.

MAIN WIRE SWITCHBOARD.

While the general appearance of a several-sections switchboard with its many loops, cords, pegs and other paraphernalia usually impress a novice with the idea that it is a very complicated piece of mechanism, the fact is it is a very simple and easily learned device for assembling and distributing the circuits connected therewith. The main thing is to study its construction, and the manner in which wires are transferred from one section to another when so required. The operation becomes understandable almost immediately. In fact, the shifting about of circuits is the easiest lesson learned. The skill of a wire chief is his good judgment and ability to "patch" wires in such a manner as to not only restore the greatest number of broken circuits with a minimum number of available conductors, but to so assemble the parts that the respective sizes or guages of the broken ends are assigned where they will prove most beneficial under the existing conditions. To do this he must possess a thorough knowledge of the working capacity or requirements of each circuit, both as to volume of business and speed of transmission; whether worked Morse, or automatic, etc. For this reason wire chiefs are usually selected from among those operators who have served as traffic chiefs or otherwise acquired an initial knowledge of pretty nearly every through and way circuit in the room. Such persons are always in line for promotion although they may not suspect it.

Figure B illustrates pretty closely the general appearance and construction of a terminal main-wire switchboard. As may be seen, it consists of a number of brass springjacks, vertical strips of brass, and disks arranged side by side across the structure. With the exception of the springjacks and upright bars employed as "flips," or transfers, as some prefer to call them, the construction of the others is identical, and each bar and companion springjack represents the switchboard connection for a given external main line circuit. The detached diagram on the left of the cut shows the complete switch wiring for an external circuit. The main wire should be attached to one lip of the springjack—it does not matter which, so long as all are connected alike—and the

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other lip connected by wire to the vertical bar immediately above it. This connection with the long vertical strip provides a means of extending the main wires, loops, or desk apparatus across all the horizontal rows of series connected disks in the board, any one of which latter may be connected with the circuit by means of a metallic peg inserted between the bar and the disk alongside of it. It follows, then, that if we connect any two upright bars to the same horizontal row of disks, the two wires which those vertical strips represent will be joined together in series in one circuit. Vertical strips thus joined together in one common circuit also place in series whatever apparatus happens to be inserted in the respective springjacks beneath them. If the wedge of a duplex set is placed in the springjack of a transfer that particular duplex set will be extended to the wire connected by a peg to the same horizontal row of disks, the number of which corresponds with that of the transfer used. In like manner desks, and all other apparatus are similarly connected or transferred from one circuit to another. Transfers or single flips are constructed practically the same. The only difference is that instead of having an external wire connected to one lip of their respective springjacks the latter are connected permanently to certain rows of the horizontal disks and are numbered to correspond with the number of the row each is assigned to. Thus the transfer jack shown on the right of the diagram is connected permanently to the second row of disks, hence it becomes transfer No. 2. When a desk or other apparatus is inserted in the springjack of that particular transfer the wire we desire to reach must invariably be connected by a peg to row No. 2 and the battery for the circuit connected to transfer No. 2 as shown.

Sometimes we use "double flips." This is simply two single flips placed together in series. They possess the advantage of being able to hold a greater number of wedges and may be connected to any two idle rows of disks desired. The connections for joining two circuits together are shown near the middle of the diagram. The battery disks are always confined to a designated row or number of rows. Unlike the other disks, however, the latter are not joined together in series behind the board. Each round disk is separated from its companion and represents a battery power of a given number of volts.

The student will quickly understand the manner of making these connections if he will try to make a few imaginary patches with this diagram before him.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 873,757, for a transmitting device for electric telegraphy, has been granted to Isidor Kitsee, Philadelphia. A polarized relay has its two coils connected with separate batteries. The armature of the relay is provided with contacts so arranged that each depression of the transmitting key connects the line alternately with the different batteries.

A patent, No. 874,209, for electric transmission of intelligence, has been awarded to Isidor Kitsee, of Philadelphia. Means to neutralize the inducing effect of a power wire on neighboring lines of transmission comprises a conductor placed in the neighborhood of the lines of transmission and connected in shunt with the return of the power wire.

A patent, No. 874,602, for a telegraph key, has been issued to John P. Kinney, of Pocatello, Idaho. The key lever has an operating member arched to span the instrument so that it can be operated from the side opposite that from which the key lever projects.

A patent, No. 874,826, for nullifying disturbances in telegraphic or other signaling circuits, has been granted to Edward Blakeney, of Ossining, N. Y., and Robert E. Chetwood, Jr., of Elizabeth, N. J., assignors to the American Telephone and Telegraph Company. A telegraph system consists of a main circuit, a Wheatstone balance system having its branches connected in the main circuit, a receiving instrument in the bridge of the balance, and a condenser connected in a portion of each branch at each side of the bridge, and rendering the portions impassable to steady current.

A patent, No. 875,410, for a printing telegraph receiver, has been awarded to John Burry, of Ridgefield Park, N. J. Relates to receiving or printing apparatus for type telegraph systems.

A patent, No. 875,643, for a printing telegraph, has been issued to John C. Barclay, of New York. Details of circuits and mechanical construction.

A patent, No. 875,660, for a printing telegraph, has been taken out by Frederick J. Haig, of Hyattsville, Md. Construction of printing telegraph in which the transmitter closely resembles in structure and in operation the usual commercial typewriting machine.

The following patent has expired:

Patent No. 443,381, for a telegraph transmitter, held by S. W. Smith, of New York.

Personal.

Mr. Stephen D. Field, the well known electrical engineer of Stockbridge, Mass., was a recent visitor in New York, coming to the Metropolis on one of his periodical trips incidental to his profession.

Mr. W. W. Umsted, manager of the Western Union Telegraph Company at Omaha, Neb., accompanied by his wife, will sail for the south of Europe on the White Star steamer Republic, on the 25th inst., which makes the Mediterranean trip. Mr. Umsted goes abroad for a period of rest.

Miss Bessie Merritt Reynolds, the daughter of Mr. and Mrs. Harvey D. Reynolds, of Buffalo,

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N. Y., Mr. Reynolds being the superintendent of the Postal Telegraph-Cable Company at that point, was married on December 31 last to Mr. William Loomis Stow. The newly married couple will make their home at North East, Pa.

Mr. S. S. Garwood, of Philadelphia, a well-known old-time telegrapher, at one time manager of the Philadelphia Western Union office, and for the past twenty years a member of the executive committee of the Telegraphers' Mutual Benefit Association, is mourning the loss of his mother, who died on January 7.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Col. R. C. Clowry, president and general manager of the company, accompanied by Frank Jaynes, of San Francisco, general superintendent of the Pacific division, together with Mrs. Jaynes, Mrs. H. D. Estabrook and Frank J. Scherrer, private secretary to Col. Clowry, are in Florida on a two weeks' vacation. At Richmond, on the journey South, the party was joined by Jacob Levin, of Atlanta, general superintendent; L. J. Maxwell of Richmond, superintendent, and W. F. Williams of Portsmouth, Va., superintendent of telegraph of the Seaboard Air Line, who accompanied it to Jacksonville.

Mr. S. R. Crowder, electrician of the southern division, Atlanta, Ga., was a recent New York visitor, as was also Charles Selden, superintendent of telegraph of the Baltimore and Ohio Railroad Company, Baltimore.

Mr. W. E. Peirce, of Washington, D. C., has been appointed to the position of repeater chief at New Orleans, La.

Mr. W. J. Higgins has been appointed chief operator at Buffalo, N. Y., vice Herbert C. Worthen, transferred to New York.

Mrs. J. L. Hambleton has been appointed manager at Beaver Falls, Pa., vice Miss M. H. Britt, resigned.

Mr. B. W. Jones has been appointed manager at Connellsville, Pa., vice Miss J. M. Taylor, resigned.

Mr. E. W. Wade has been appointed manager at Dunkirk, N. Y., vice Robert Doyle, resigned.

Mr. G. S. Walters has been appointed manager at Warren, Pa., vice C. H. Repman, resigned.

William Ingold has been appointed manager at Portland, Ore., vice William Dumars, transferred to Sacramento, Cal., where the latter succeeds as manager J. W. Whiteley, who has been transferred to the operating department at San Francisco.

A. E. Littler has been appointed manager at Reno, Nev., vice T. H. Brown, transferred to the operating department.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

The tariff rate book for 1908 made its appearance promptly with the new year. The arrangement of this work as usual was undertaken by Isaac Smith, superintendent of tariffs, and his skilful methods in such work are reflected throughout the 650 pages of the volume. The information conveyed is comprehensive and fully brought down to date, the maps shown are clear, and the volume will be welcome to all who have occasion to use such a publication.

Frank B. Travis, chief operator at Washington, has been appointed manager of the same office, vice J. D. Prosser, resigned.

L. A. Boone, of the Boston office, has been appointed manager at Newport, R. I., vice G. M. Foote, transferred to Washington, D. C.

The Cable.

Mrs. Mary A. Penn Austin, aged eighty-five years, died on December 20, at the home of her son Stephen F. Austin, assistant superintendent of the Commercial Cable Company, New York.

Agitation on the part of the press in Australia has given rise to representations to the Pacific Cable Board to reduce press rates between Australasia and Great Britain. Sir Joseph Ward, the Premier of New Zealand, in the course of an interview, said that he was in communication with the Pacific Cable Board, and that it was sought to reduce the rate from 1s. to 4d. per word.

Cable communications interrupted January 13, 1908:

Venezuela	Jan. 12, 1906.
Orkney, Shetland and Faroe Islands and Iceland	Jan. 2, 1908.
Demerara	Jan. 8, 1908.
Island of Lombok	Jan. 10, 1908.
Cayenne	Jan. 11, 1908.

The London Electrical Review reports that Tom London, chief engineer of the Telegraph Construction and Maintenance Company, Limited, of East Greenwich, who had been sent to Mombasa to superintend the laying and repair of cables, left the cable ship with Mr. Ansell, of the Eastern Telegraph Company, for a shooting expedition, and failed to return. Search parties were organized, and the country was scoured, without success; a reward of £100 was also offered, and the Colonial Office took action. Up to December 31 no news had been received, though Mr. London had then been away ten days.

Mr. London is well known to the cable fraternity in the United States.

Messrs. Muirhead and Company, of London, brought suit in that city for the revocation of the letters patent granted to S. G. Brown, for a telegraph relay used in connection with submarine cabling, on the ground of want of novelty, utility and subject matter. The letters patent referred to the invention of a relay for re-transmitting messages received through cables and for apparatus used therewith. In May, 1906, Alexander Muirhead and Muirhead and Company, Limited, presented a petition for revocation of the patent, which was served on the owners of the patent. Justice Neville, after a nine days' hearing, held that the

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petitioners had failed to establish any of their objections to the patent and dismissed the petition. On appeal to a higher court the opinion of Justice Neville was sustained, and the case was again dismissed.

The Railroad.

J. F. Clement, superintendent of telegraph of the Toledo, St. Louis and Western Railroad has been appointed superintendent, with office at Frankfort, Ind.

A course in telegraphy has been added to the studies pursued at the high school, St. Albans, Vt. It is made possible by the action of the Central Vermont Railway Company. The department is in charge of Edward T. Buck, and is well fitted with telegraph instruments.

The Wisconsin Central Railroad is contemplating a legal fight to test the validity of the eight-hour law applying to telegraph operators of the railroads of the state of Wisconsin. While the Northwestern and the St. Paul roads will temporarily at least obey the law, the latter will attach telephone systems to block wires and will try the telephone system.

A new electric signaling apparatus specially designed to prevent collisions in foggy weather, has been on trial in England. The apparatus consists of a short double third rail run between the rails near both the distance and home signals. The third rail is connected by electric wires run along by means of the telegraph poles to levers in the signal cabin. Attached to the engine are electric metal "hangers," or "shoes," which come into contact with the third rail and establish communication with the signal box. The instrument contains two small semaphore arms similar to the home and distance signals at the side of the line. There are also two small glass bull's eyes of red and green to correspond with the miniature semaphore. At the back of the case of the instrument is fitted a bell and there is a telephone at each side. As the train reaches the distance signal the "shoes" hung under the engine glide on to the third line and complete the connection with the instrument on the cab of the engine. Immediately the bell rings in the engine cab and the miniature semaphore in the cab repeats the signals from the signal cabin.

RAILWAY SIGNAL ASSOCIATION.

The meeting of the Railway Signal Association was held in the Engineers Societies building, New York, Tuesday, January 14. At the morning session the subject discussed was the report of Committee No. 4, Automatic Block Signals, as presented at the annual meeting at Milwaukee, and there accepted as a progress report without discussion. At the afternoon session there was a paper by F. R. Cook on Economical Operation of Electric Signals and Care and Maintenance of Storage Batteries; also the report of Committee No. 3. Electric Interlocking. At the Executive Committee meeting on December 2, 1907, it was voted that the dues for representative members for 1908 should be $1 per vote per annum. Instructions to committees are to be published in the annual proceedings. Proceedings for 1908 are to be published as follows: Subjects for March meeting to be mailed February 25; subjects for May meeting to be mailed May 1; subjects for September meeting to be mailed August 15. Advance notice of annual meeting to be mailed two weeks in advance of date of meeting; discussion at annual meeting to be mailed December 20. The September meeting is to be devoted to reading of papers presented and accepted by the Executive Committee; no reports of committees for annual meeting to be discussed.—The Railroad Gazette.

PROMOTION OF J. C. BROWNE.

J. C. Browne, general foreman of telegraph, has had his jurisdiction extended so as to include the Missouri Pacific Railway, embracing the entire Gould system, 8,000 miles in extent, with headquarters at St. Louis. Mr. Browne succeeds General Foreman J. H. Baker of the Missouri Pacific at Sedalia, Mo., whose death recently occurred. There will be in future no general foreman for the Iron Mountain and Missouri Pacific, but the work of those two divisions will be handled by C. E. Wynne, assistant general foreman for the Iron Mountain at Little Rock, Ark., and I. C. Redmond, assistant general foreman of the Missouri Pacific at Sedalia, Mo. The changes were effective January 1.

Mr. Browne was born on a plantation in North Alabama in 1866. When twelve years of age he began to serve as a telegraph messenger during school vacations in the meantime learning to telegraph, until 1881 when he secured a position as an operator on what is now the Southern Railway. After a short service with the Western Union Telegraph Company at Memphis in the following year, he became a train despatcher in the general superintendent's office of what at that time was the Little Rock and Memphis Railway. Early in 1884 he became an operator in the general office of the Missouri Pacific Railway at Little Rock. In 1887 he was appointed chief operator and manager of the Little Rock relay office. In 1892, in connection with the same, he worked in construction gangs, performing actual labor of telegraph construction and reconstruction work. In July, 1895, he was appointed general foreman of telegraph construction and repairs in connection with his managership of the Little Rock relay office. In this dual position he served until August, 1907, when he was relieved of the managership of the Little Rock office, and given exclusive charge of telegraph construction and repairs on the St. Louis, Iron Mountain and Southern Railroad, leased and operated lines.

By virtue of his present office Mr. Browne will have charge of all matters pertaining to construction, repairs and maintainance of the telegraph department of the Missouri Pacific system.

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Government Control of the Telegraph in Canada.

The question of government control of the telegraph and telephone is agitating the Dominion Parliament. The Governor-General in his speech opening the current session stated that "the time has arrived when the public interest requires that telegraph and telephone companies holding Federal charters shall be placed under government control. A bill will be introduced for that purpose."

In the debate that followed in the House of Commons an explanation was demanded of the government by R. L. Borden of the statement, the questioner wanting to know whether or not it meant bringing these public utilities under the control of the Railway Commission, as had been indicated.

Sir Wilfred Laurier, the premier, in reply said there was a tendency in Canada at present, derived from the other side of the boundary line, to denounce all corporations and represent them as inimical to the public weal. The truth was that the corporations, like all human institutions, were a mixture of good and evil. It was undeniable that corporations had sometimes acted mischievously, but it was also true that corporations had been one of the most potent agents of the creation and distribution of wealth among all classes of the community. It was undeniable that corporate capital, corporate labor and corporate effort would do more than individual capital, labor or effort. Sir Wilfred said that a member had exclaimed: "Down with all corporations, down with the railway corporations, and let the state perform the duties they are called upon to serve." The leader of the opposition argued one way, and concluded the other, but the man who looked upon the question calmly and dispassionately must come to the conclusion that the interests which were served to-day by private enterprise were better discharged than they could be by the state. The question was as to a remedy, and he apprehended that the remedy was not to entrust the railways to the state. The true policy was to have the corporations subjected to the control of Parliament, which would see they discharged their duties properly.

At this point a member demanded: "What about Germany?" Sir Wilfred replied, with some heat, "Thank God we are not here to take example from Germany or Russia." Again the member interrupting said, "What about New Zealand and Australia?"

Sir Wilfred, continuing, answered that the colonies named were young commercial communities that had gone much further than he would agree to go. If the incentive of ambition and emulation were removed the result would be suppression of progress and the introduction of stagnation and immobility. He cited the Canadian Pacific Railroad, first commenced as a government enterprise, but finished and now operated by a private company, in support of his contention. So far as his recollection went, not a single word had been uttered against the change from public ownership. He alluded to many enterprises of the Canadian Pacific, such as hotels, smelters, lake and ocean fleets, the operation of coal mines, and asked if his honorable friend pretended that this would exist to-day if the railway was a government enterprise. It was true there were complaints in various parts of the country against the railway service, but the remedy was control by the government and parliament. Passing to the opposition's platform relative to the nationalization of telegraphs and telephones, he took issue with the statements made in Mr. Borden's speeches as to the success of government telegraph and telephones in Britain. The report of the British postmaster-general showed that in the last fiscal year there was a net deficit on the telegraph branch of £652,000 ($3,260,000), and if interest on capital were added to the total, a loss of £923,000 ($4,615,000), while the telephone department did business at twenty per cent. less than cost. "Now, sir, upon this point, as upon the other," Sir Wilfred went on, "we think on this side of the house that the remedy is not government ownership, as has been advocated by my honorable friend, but private ownership and government control. He has asked me what we mean in regard to this. We mean that we shall introduce legislation to increase the power of the Railway Commission, increase its membership as well, and give it control of telegraphs and telephones, as it has of railways."

Theory of Metallic Conductivity.

Prof. J. J. Thomson, in a recent paper before the British Institution of Electrical Engineers, summarizes the "corpuscular" or electron theory of metallic conduction and indicates a few modifications of it which have become necessary in the light of recent observations. The theory may be stated as follows: "By the action of one atom of the metal on another, corpuscles are split off from the atoms, and they remain diffused through the mass of metal; so that we may picture to ourselves a metal as somewhat like a porous body, the pores of which are occupied by a substance with the properties of a perfect gas. In the older theory it was supposed that these corpuscles remained free for a time sufficiently long to enable them to get in thermal equilibrium with the metal itself, so that, like all gases, the average kinetic energy of the corpuscle was a constant merely depending upon the temperature." The modification now required, says a writer in Science Abstracts in giving the points of Professor Thomson's paper, is to suppose that the electric force, instead of acting on the corpuscles after they have left their atoms, really acts upon the atoms before the corpuscles leave them. The atoms probably act on each other like a system of electric doublets, and the electron flows.—Western Electrician.

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Death of Wilson H. Fairbank.

Wilson Henry Fairbank, aged seventy-one years, died at his home in Warren, Mass., on January 5, after an illness lasting several weeks. Mr. Fairbank was born at Warren, April 3, 1836. Early in life he became associated with his father in the firm of A. Fairbank and Company, the concern furnishing the poles for the first telegraph line constructed between Boston and Lowell. As a constructor of telegraph lines in this country the name of Wilson H. Fairbank occupies a unique and honored position. At an early age he displayed the energy and force of character that distinguished him throughout his business life, for in forty-five days, five days ahead of his contract time, he delivered to the American Telegraph Company over nine thousand poles. The success attending this undertaking determined his future career, which became that of a contractor, in which, particularly in his earlier days, the construction of telegraph lines became almost his specialty. Many of the long and important telegraph lines in all parts of the country were built by him and are monuments to his extraordinary capacity, not only for great undertakings, but as well for their rapid and satisfactory accomplishment.

WILSON H. FAIRBANK.
The well-known Telegraph Line Constructor who lately died.

In 1865 he built a line from Brownsville, Pa., to Pittsburg, Pa., and on reaching Pittsburg the Pacific and Atlantic Telegraph Company was organized and W. H. Fairbank and Company took the contract to build all the lines of this company, to establish all offices and deliver a complete working plant to the stockholders. They built two lines to the East over the Alleghany mountains, one on the national road to Baltimore and Washington, the other over the Pennsylvania Railroad to Philadelphia. They also extended the lines South and West to Cincinnati and Chicago. In 1876, in connection with Jay Gould, General Eckert, D. H. Bates and others, he began the extension of the lines of the Atlantic and Pacific Telegraph Company from Louisville, Ky., to New Orleans. This line was 963 miles in length and was completed in ninety-three days, the fastest construction work which had ever been done.

In 1877 the Continental Telegraph Company was organized, and he took the contract to build the lines from New York to Philadelphia. This was known as the best constructed line in the country up to that time. When the American Union Telegraph Company was organized, he was one of the first in the field, and at one time was running successfully twenty-one different gangs of men and built thousands of miles of first-class lines. He also built ninety miles of what is known as Eckert's line from Jersey City to Philadelphia, considered the best ninety miles of telegraph line in the world. On the consolidation of the telegraph companies in 1881, he became superintendent of construction for the Mutual Union Telegraph Company, and after building over 2,000 miles of lines he was appointed general superintendent of repairs and construction.

In July, 1882, he took charge of the construction of the Postal telegraph lines, and built for that company a very superior structure from New York to Chicago, and thence to St. Louis, also from Buffalo to Pittsburg through the oil regions, and from New York to Washington. After completing his contract with the Postal Telegraph Company, Mr. Fairbank was appointed by the United telegraph lines general superintendent of their construction and repairs. In 1884 he built a line for the Baltimore and Ohio Telegraph Company, extending from Cairo, Ill., to Galveston, Tex., and from Houston to New Orleans. This work of over 1,100 miles was completed in five months.

In 1885 he was engaged by the American Telegraph and Telephone Company as general superintendent of construction to build the long-distance telephone lines, using 90-foot poles and 20 to 100 copper wires. He remained with this company over six years, with full charge of all the Eastern construction. Ill health compelled him to leave the construction business, and he retired to his old home in Warren.

Mr. Fairbank had the tact and intelligence, by which rights of way were secured, formidable obstructions overcome, the sturdy, dogged, sleepless fight that finally wins, which enabled him to take a contract for a thousand miles of line of a dozen wires, and hand it over, a clean, unincumbered plant into the company's hands.

His business life has been one covering a very large field of experience and it is said that the accuracy of his accounts was never questioned.

Mr. Fairbank was interested in a number of manufacturing and commercial enterprises, and his country life and affiliations carried him also

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into the Grange and Farmers' Club. He was a Mason and an Odd Fellow, in both of which orders he showed a warm interest. He had served in the Legislature of his state with distinction and marked fidelity, both in the House and Senate, and was honored by his state in being appointed to numerous representative positions.

DEATH OF JOSEPH W. KATES.

Joseph W. Kates died at his home in Manchester, near Richmond, Va., on January 1. He was sixty-six years of age. Mr. Kates had a long and interesting record as a telegrapher. He entered the service in 1856, and was the first operator at the railroad office of the Magnetic Telegraph Company at Wilmington, Del., when it was opened in the year named. From Wilmington he went to Petersburg, Va., thence to Richmond, and in 1860 was appointed manager of the office at Alexandria, Va. His sympathies caused him to cast his lot with the Confederate cause, and he served the South in his capacity as a military telegrapher with conspicuous ability. He was in charge of the office at Manassas, Va., during the battles of Blackburn's Ford and Manassas. He transmitted the famous message from President Jefferson Davis to Gen. Joseph E. Johnston at Winchester, ordering that officer to make a junction with Beauregard at Manassas. He was afterwards attached to General Beauregard's army in the Southwest, and subsequently was appointed military superintendent of telegraph in that general's department, embracing South Carolina and Georgia, with headquarters at Charleston. At the close of the war Mr. Kates found employment in the telegraph service at New York. In 1866 he was appointed superintendent of the Western Union Telegraph Company at Lynchburg, Va., headquparters being removed to Richmond in 1872. In 1882 he was made general superintendent of the Southern Telegraph Company, and in 1888 was appointed to a like position in the service of the Postal Telegraph-Cable Company at Richmond, from which he retired in 1904.

Mr. Kates was held in high esteem by his friends and neighbors in Richmond. Several months ago he suffered a stroke of paralysis.

OBITUARY NOTES.

J. Murray Fairchild, a well-known San Francisco telegrapher, died at Oakland, Cal., December 12, aged sixty-nine years. He was manager of the Western Union Telegraph Company at New Haven for many years, resigning in 1881 and going to the Pacific Coast two years later on account of ill health. Mr. Fairchild was an inventor of some note, one of his inventions being a trap lock for fire-alarm telegraph boxes, a device which came into general use.

Frank McRavey, aged fifty years, one of the veteran telegraph operators in Milwaukee, and for nearly thirty years an employee of the Western Union Telegraph Company, died January 6, after a week's illness of pneumonia. He is survived by his wife, one daughter and two sons.

Services in Memory of Lord Kelvin.

Lord Kelvin's memory was signally honored in a memorial service held Sunday afternoon, January 12, under the auspices of the American Institute of Electrical Engineers, in the auditorium of the Engineers' Building, No. 33 West Thirty-ninth street, New York. Several hundred scientists and technical men, representing national societies, were in attendance, and, in true reverence to the memory of the great man, adopted a resolution extolling the qualities of Lord Kelvin.

President Henry G. Stott, of the American Institute of Electrical Engineers, conducted the meeting. Andrew Carnegie was among those present, but took no part in the speeches.

Speaking of Lord Kelvin as a Christian, the Rev. Dr. Manning said:

"We are here to pay a tribute to one who was not only the greatest scientist of his own age, but one whose name takes its place among those of the masters of thought in any age. It is not suprising that Lord Kelvin should have been a Christian and a churchman. The controversy between religion and science has passed, and we all realize that truth is one, whatever its source. It is an encouragement and an inspiration to hear a man like Lord Kelvin say that the facts of science demand the recognition of a Supreme Power in the universe, and that with the utmost freedom of thought we are bound to recognize that science is not antagonistic to religion, but a help to it."

Professor Elihu Thomson described Lord Kelvin's inventions. Professor Edward Nichols, of Cornell University, in speaking of Lord Kelvin as a scientist, said:

"Lord Kelvin made a lifelong study of the doctrine of energy and the mathematical theory of heat, electricity and wave motion. The constitution of matter he had always with him. His contributions to any one of these great fields would have made him great, but the combination of all of them made him the foremost scientist. He was the only man that could give Cyrus Field a definite answer as to the practicability of the laying of an Atlantic submarine cable. His technical output, or inventions, were valuable by-products of his scientific activities."

Rear-Admiral Melville, T. C. Martin and George G. Ward, vice-president and general manager of the Commercial Cable Company, were among the other speakers. The latter spoke at length on the work of Lord Kelvin in respect to the submarine cable.

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Adjustment of Relays and Sounders ..... Oct. 1, 1902
Alternating Current Transformer for Quadruplex, W. H. Jones ..... Mch. 1-16, 1904
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Alaskan Telegraphs ..... Jan. 1-16, Feb. 1, 1905
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Engraving of Col. Robert C. Clowry ..... Apl. 16, 1902
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Phillips' System of High Speed Telegraphy, J. W. Larish, Nov. 1, 1904
Pollak-Virag System ..... Mch. 1, 1903
Possibilities of Telephoning Over Tracks to a Moving Train ..... Mch. 1, 1904
Postal Telegraph-Cable Company, History of (with portraits of officials) ..... Feb. 1, 1904
Postal Telegraph-Cable Company Rules Governing Construction and Repair of Telegraph Lines, Apl. 1-16, May 1-16, 1904
Printing Telegraph Systems, Modern High Speed, J. C. Barclay ..... Nov. 1, 1904
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Progress of Telegraphy During Last Thirty Years, W. Maver, Jr. ..... Mch. 16, 1904
Proper Adjustment of Telegraph Apparatus ..... Aug. 16, Sept. 1, 1904
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Western Union Telegraph Company, History of (With portraits of officials) ..... Jan. 16, 1904
What Constitutes a First-Class Operator ..... Oct. 1, 1904
What Constitutes a First-Class Chief Operator ..... Nov. 1, 1904
What Constitutes a First-Class Manager ..... Nov. 16, 1904
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What Constitutes a First-Class R. R. Operator ..... Dec. 16, 1904
Wheatstone Automatic Duplex ..... Apl. 1, 1902
When is a Storage Battery Fully Charged ..... Aug. 16, 1904
Wind Pressure on Telegraph Structures, F. W. Jones .... Dec. 16, 1903
Wire Tables—How to Remember Them, C. F. Scott ..... Apl. 16, 1905
Yetman Transmitter (Description and Engraving) ..... Aug. 1, 1903

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Morse Patents, Covering Invention of Telegraph ..... Dec. 16, 1906
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Murray Automatic Page-Printing Telegraph, History of .. Sept. 16, 1906
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Rudd Revolving Addressed Envelope Holder ..... Feb. 16, 1906
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Train Order Rules, Chas. Selden ..... Aug. 1, 1906
Wire, Hard Drawn Copper, History of, Thos. B. Doolittle ..... Jan. 1-16, 1906
Wheatstone Bridge, F. W. Jones ..... Nov. 16, 1906
Wright Keyboard Transmitter and Printer, R. Hitchcock .. Apl. 1, 1906

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26, 1908.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Railway Signal Association will meet in 1908 at a date and place to be named later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., in 1908, at a date to be named later.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers' Association meets at Fort Worth, Tex., on June 18, 1908.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

The influx of new men in the telegraph service who are taking the places of those who went out on strike, has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is $1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

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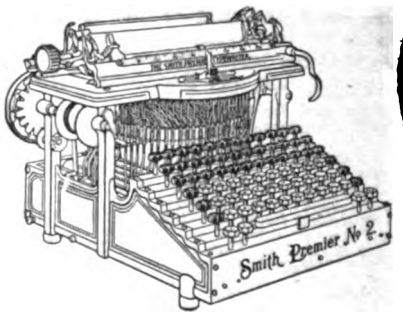

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is the only telegraph newspaper published in England. All who wish to know what is going on in the British Postal Telegraph Service and to keep abreast of the progress of technical improvements in telegraphic apparatus and methods, should subscribe to the

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NEW YORK, JANUARY 16, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The Anniversary Number.

Readers of Telegraph Age appear to be well satisfied with the January 1 issue, the twenty-fifth anniversary number. From all over the country and from Canada we have received numerous letters of congratulation on the production of so fine an edition, the consensus of opinion being that it was by far the best paper that Telegraph Age has ever turned out. Well, we may be permitted to say that we think so, too, and as our friends are pleased and we are satisfied with our efforts, at least for the present, we should like to take our subscribers into our confidence and put them in possession of a few statistical facts relative to this big number. It was an expensive publication, for each paper weighed a pound, and the white paper required for each was valued at about six and a half cents. Several tons of paper were necessary for this edition. The cost of mailing the anniversary number was enormous, for, apart from the domestic postage, which is charged for in "bulk," individual papers going to Canadian subscribers were paid for at the rate of four cents apiece, while for all other papers going to foreign countries, eight cents apiece was the rate. Thus it will be seen that, outside of the editorial labor involved, the mechanical cost of production and of placing the paper in the hands of subscribers, was very large.

The Threat of Another Telegraphers' Strike.

Statements begin to appear that on the first of March next, unless certain wrongs alleged to exist within the economy of the telegraph, are righted, another strike of telegraphers will probably be called. These reports, which are given more or less currency in the public press, seem to emanate mainly from a clique of unemployed operators at Chicago, who, when the recent strike went into desuetude, were left by the receding wave of a witless excitement stranded on the inhospitable shore of Non-Employment. In the astonishment and bewilderment of mind that has since possessed these individuals consequent upon the realizing sense that the telegraph companies have been able to dispense with their services, has come the temptation to threaten further disturbance in the telegraph industrial field. The declaration, which has been made, that an order to strike would be obeyed by a large majority of operators employed by both the Western Union and Postal telegraph companies, is so ridiculous that were it not for the fact, strange as it may appear, that many so out of employment still hold to the belief that the telegraph companies may yet be forced into a recognition of the union, and so to agree to a general reinstatement of the men, the matter would receive no recognition at our hands. To so illogical an assurance of mind, it is difficult to give credence. The movement referred to has been declared to be a secret one. Perhaps it is, for we do not know what countenance, if any, the Commercial Telegraphers' Union is extending to the ill-advised utterances of those who proclaim their allegiance to that body, but if the non-expressive attitude maintained by the organization be construed as indicating official approval of these circulating threats, the fulfilment of which is designed to work injury to telegraph interests, those instructed with its conduct are assuming a great responsibility.

Telegraphers at all points, who went on strike, feel that their union treated them badly and that they were grossly deceived by its representations. Of striking experiences, no matter with what original enthusiasm and good faith entered upon, they have had more than enough. At the conclusion of their escapade those who did not succeed in gaining reinstatement in telegraph employ are sore because of the plight they are in, many being in actual want; those who were fortunate enough to be taken back are rejoicing at their good fortune, yet marveling at their narrow escape from permanent disaster. No surprise need be felt by any one because within the army of the employed only expressions of loyalty

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to employing interests are heard, while condemnation, disgust and distrust of the union, its influences and tendencies, are freely uttered.

It is sheer folly to talk of instituting another strike, and time and opportunity are worse than wasted to give such a proposition thought even. Moreover, outside of Chicago, which, in this instance as in others, is maintaining its reputation as a center of disturbance whether in industrial, social or political matters, the thought of a strike is foreign to the intelligent mind, and those who are agitating the matter should be sternly repressed.

It is estimated that there are between 4,000 and 5,000 telegraphers unemployed in this country to-day, mainly as a result of the strike. With such an idle body of men whose mistaken zeal, to put it as kindly as possible, has placed them in the unfortunate position they are in, and whose ambition now is to get back again at work, it is not probable that an appeal to the employed to strike, which means a surrender of their places to a waiting crowd eager to step into the vacated positions, would be met other than with derision. A strike of commercial telegraphers is not likely to occur again while the present generation is yet alive. Such strikes have a tendency to terminate in a manner that recall the old lady's exclamation when the train on which she was traveling finally came to a standstill in a frightful wreck—"Do they always stop so?"

A Directive System of Wireless Telegraphy.

The article by Messrs. E. Bellini and A. Tosi, published in the December 28 issue of the Electrical World, describes in a very clear and interesting manner some experiments on directive wireless telegraphy carried out between three coast stations of the French Government, remarks that paper. At the first stage of wireless telegraphic development all efforts are turned to making the outgoing waves as powerful as possible and the incoming waves as readily detected as possible. In the stage of development already reached, there are too many waves coming from different sources, and the problem is rather how to detect the particular one desired and to suppress all the rest. It has been known for some time that electromagnetic waves coming from a given point on the horizon would be capable of affecting a pair of antennas in the line of arrival, while incapable of affecting a similar pair in a line perpendicular thereto, i. e., a line parallel to the wave front. This plan has been utilized both with open and closed multiple antennas to locate the azimuth of a distant radiant. This method is elaborated in the article to the extent of employing a permanent structure of two closed receiving antennas in mutually perpendicular planes, acting on a movable secondary circuit, so as to swing about a pivot, and determine the azimuth of the distant radiant. The principal value of the experiments reported in the article lies in the quantitative measurements of the power emitted and received by a vertical closed antenna loop. It is shown that the electric and the magnetic intensities in the waves make a double circle dumbbell diagram or sinusoidal diagram, while the powers are as the products of these two components, or form a double elliptical dumbbell diagram. It is open to debate, however, whether the electrolytic receiver responds more to current than to power. It would appear more probable, from the investigations already published, that this receiver depends almost entirely on the power.

Balloons and Air Ships for Army Use.

Balloons in the future will contribute a more important service in the conduct of war than ever before, for from great heights the movements of the enemy may be observed and telegraphed to the army below. This is fully recognized by the Army Signal Corps, and General James Allen of that corps recently made a call for bids for dirigible balloons and flying machines for army use. This request has served to stir up apparently all the cranks on the subject in the country and in consequence a flood of letters has been poured in upon the department. Major Edgar Russel in speaking of the matter said:

"Of course we are in correspondence with men who have given much study to scientific aeronautics, but the number of persons who have the flying machine bee buzzing in their heads is appalling. For years we have received occasional requests from men who said that they could fly if they only had the chance, and since we began experimenting with balloons about a year ago the stream of letters has been constant, but never so heavy as at present."

While the correspondence in regard to the airships has been heavy, few bona-fide proposals have yet been received at the War Department. It is expected that they will come with a rush before the dates set for opening the proposals, January 15 for dirigible balloons, and February 1 for airships heavier than air. Many persons who write to the department about flying machinevs overlook the fact that what the Signal Corps demands are not plans and drawings ot machines, but the machines themselves. In other words, the department takes the stand: "You must show me." The machines will all be tested at Fort Myer before the award is made.

"Postal" Telegraphy in France.

It is announced from Paris that M. Simyan, French Minister of Posts and Telegraphs, has just made an important reform which will go far to remove the criticism to which the French postal service has long been subjected. The reform takes the shape of a "letter telegram." When a French citizen misses the last mail for some point in France, however distant it may be, he may turn his letter in at a special wicket and by the payment of a very small sum have his letter or letters transmitted by telegraph during the night. At the place of destination the letter thus telegraphed will be placed in an envelope and delivered by the postman on his first round the next morning.

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Legal.

In the United States circuit court at Little Rock, Ark., Judge Trieber handed down his decision on January 2 in the case of Logan and Bryan vs. the Postal Telegraph-Cable Company, of Texas, the attorney-general and several of the prosecuting attorneys of the State of Arkansas. The case involved the constitutionality of the act of the late general assembly of Arkansas absolutely prohibiting all contracts for futures on margins, making the posting of quotations prima facie evidence of a violation of the act.

The decision has been awaited with great interest, not only by the people of Arkansas but by many brokers in New York, Chicago and New Orleans, as this is the first decision of a federal court on that class of legislation which has lately been enacted by the legislatures of most of the Southern states at the request of the Farmers' Union.

The opinion of Judge Trieber is quite elaborate and covers twenty-seven typewritten pages and is a victory for the state on all questions involved. The court holds that as to the attorney-general and prosecuting attorneys of the state it is without jurisdiction upon two grounds. First, that it is, in effect, a suit against the state and within the prohibition of the eleventh amendment of the Constitution of the United States; and, second, that courts of equity have no power to enjoin criminal proceedings in state courts unless they result in depriving the party of vested rights which are protected by the Constitution of the United States, which the court finds is not the case in this cause.

In sustaining the constitutionality of the statute, it is held that every state has the right to prescribe the rules of evidence for its courts, and for this reason the fact that the act makes certain things prima facie evidence of guilt does not make the act unconstitutional under the fourteenth amendment, as the defendant is given an opportunity to disprove this prima facie presumption.

It further holds that the state has the right under the police powers to determine what shall constitute gambling and to prohibit such acts, and the courts will not review or pass upon the wisdom of such legislative acts, unless it appears plainly that the statute purporting to have been enacted to protect the public morals, health or safety of the people, has no real or substantial relation to those objects, or is a palpable invasion of rights secured by the fundamental law of state or nation. This statute is declared not to be of that nature.

It was also held that even if plaintiffs had, under the previous laws, a right to conduct such business, and in reliance thereon expended large sums of money fitting up offices, or entered into contracts involving a large expenditure of money, the state has the power to prohibit them from carrying on their business if injurious to public morals; and that there is nothing in the Constitution of the United States to prohibit the exercising of that power, citing cases in which similar laws have been upheld as well as acts of the states repealing lottery charters.

The fact that the contracts for futures were to be performed solely in other states, and that the telegraph company is engaged in interstate commerce in transmitting messages from this state to brokers in other states, does not deprive the state of the right to protect its people from immoral contracts any more than it could be denied the power to protect them from infectious diseases, even if, indirectly, such laws interfere with interstate commerce.

On that point the court said:

"The right of the states under their police power, to prevent the spread of crime and to exclude from their limits paupers, convicts, persons likely to become a public charge and persons afflicted with contagious or infectious diseases, as well as the right to protect its people from being defrauded or injured in their health by adulterated and injurious food, or to enact any laws which will prevent their morals from being corrupted, was not surrendered when the constitution conferred upon congress the exclusive right to regulate commerce among the states; and such acts, even if they do affect interstate commerce incidentally, if the main purpose was to protect its people against wrong and fraud, are a proper exercise of the reserved police powers of the state, and while the act may have affected the telegraph company's interstate business, its primary and main purpose was to prevent dealing in futures on margins in this state."

The court decides with a citation from Chief Justice Marshall, in Fletcher vs. Peck, where he said:

"The question whether a law be void for its repugnancy to the constitution is, at all times, a question of much delicacy, which ought seldom, if ever, to be decided in the affirmative in a doubtful case. The court, when impelled by duty to render such a judgment, would be unworthy of its station could it be unmindful of the solemn obligations which that station imposes. But it is not on slight implication and vague conjecture that the legislature is to be pronounced to have transcended its powers, and its acts to be considered as void. The opposition between the constitution and the law should be such that the judge feels a clear and strong conviction of their incompatibility with each other."

And also from Justice Holmes, in a later decision, where he said:

"It is not enough that the statute goes to the verge of constitutional power. We must be able to see clearly that it goes beyond that power. In case of real doubt a law must be sustained."

There is much for telegraph operators to learn respecting their calling which can be readily obtained by reading Telegraph Age—$1.50 a year.

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Carnegie Pension for Military Telegraphers.

In our anniversary number was printed the fact that Andrew Carnegie had granted a pension to be paid to those surviving members of the United States Military Telegraph Corps who may be in need of assistance. The correspondence that brought this matter to the attention of Mr. Carnegie and led to the generous action on his part was as follows:

New York City, December 9, 1907.

Mr. Andrew Carnegie,
2 East 91st Street,
New York City.

Dear Sir:

The executive committee of the United States Military Telegraph Corps of the United States Army, of which you are an honorary member, held a special meeting in the directors' room of the Western Union Telegraph Company on December 3, at which it was unanimously voted to address you as follows:

The United States Military Telegraph Corps of the United States Army, inaugurated by you, grew during the Civil War into a mighty arm of the service. Its life was marked here and there with tragedy and exceptional cases of heroism, and everywhere by patriotic and self-sacrificing service unexcelled by that of any other arm.

The service it performed was analagous to that of the signal corps combined with that of the scout and field courier and to a considerable extent it relieved the cavalry arm. The members of the corps shared the perils, privations and sufferings of the private soldier, but thus far they have been denied by the government the soldier's reward. For a quarter of a century the survivors have appealed to Congress for a pensionable status so that they might be on a parity with all other soldiers of the war, but the only thing accomplished has been the granting to them of a certificate of honorable service by the Act of January 26, 1897.

From beginning to end of the Civil War about 1,200 names appeared upon the rolls of the corps, but of that number less than 200 survive. Many of the survivors have passed the Psalmist's limit of life, three score years and ten, while the others are rapidly moving toward it. Some of them are in impaired financial circumstances and a little help would be timely. A preliminary but somewhat careful canvass has been made and it is the belief of the committee that not over ten per cent. of the whole number of survivors, that is, ten per cent. of the two hundred, are in such needy circumstances.

Knowing your love for the craft of your youth and feeling that you take a virtuous pride in the achievements of the corps of your founding, is it asking too much of you to suggest if among your many generous benefactions you can find a place for an "Honor Pension Roll," to which the surviving members of the corps would be eligible? Should you look with favor upon this proposal, we suggest that the executive committee of the United States Military Corps shall carefully consider any applications for relief that may be made hereunder and will approve only such as may appear to be worthy of such relief, all such applications to have the written approval of at least five members of the executive committee.

We venture also to make the following suggestion, that whatever relief you may see fit to bestow might be, for instance, the equivalent of the pension given by our government to the private soldier in the United States army, that is, say, $144 per year, and only until such time as Congress may pass a pension bill in favor of the members of our corps. Such a bill has been before Congress for a number of years and we have some reason to hope that it may pass during one of the sessions of the Sixtieth Congress. Perhaps any favorable action you may take upon our present petition may hasten action by Congress.

Yours very truly,
William Bender Wilson,
Ex-Officio Chairman,
David Homer Bates, Secretary.
Robert C. Clowry,
Charles A. Tinker,
Albert B. Chandler,
Members executive committee, United States Military Telegraph Corps.

New York, December 16, 1907.

David Homer Bates,
Secretary, Executive Committee,
U. S. Military Telegraph Corps,
New York.

Dear Sir:

Yours of December 9 received. I consider it a great privilege to furnish the sum indicated, one hundred and forty-four dollars each year to such members of the Military Telegraph Corps as the committee recommends. Mr. R. A. Franks, president of the Home Trust Company, Hoboken, N. J., has been instructed to place on the pension rolls those the committee recommends and mail them checks each year, beginning January first next.

Very truly yours,
(Signed) Andrew Carnegie.

Claiming that the operation of wireless apparatus on Long Island Sound steamers interferes with the receipt of messages at the United States Naval Torpedo Station at Newport, R. I., Commander Albert Cleaves of the station will protest to the companies owning the steamers against the interference, as the Government has the first rights in the matter. The wireless apparatus at the station succeeded in catching parts of messages from the flagship of Admiral Evans, the Connecticut, and the battleship Alabama, but the working of the Sound steamers' wireless apparatus, it is claimed, interfered with perfect work.

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Old Newspaper Row.

William Hamilton Young, night chief operator for the Western Union Telegraph Company, at Washington, D. C., has been in charge of newspaper despatches sent out for that city for more than fifty years. No one living to-day has a wider acquaintance among the leading journalists than this veteran of the electric key. Mr. Young has prepared a brief article on "Old Newspaper Row" for the Illustrated Sunday Magazine, together with some interesting incidents connected with the work of the men who held down desks in the historic old buildings.

Old Newspaper Row, where for nearly fifty years statemen, jurists, politicians and men of the service met and aired their views, swapped stories and absorbed information, has passed away. Not a single room on Fourteenth street, between Pennsylvania avenue and F street shelters to-day a newspaper correspondent, reporter or press telegrapher. On this block, for more than a quarter of a century, nearly all the representatives of the newspapers in New York, Boston, Philadelphia, Chicago, Pittsburg, St. Louis, Cincinnati and a score of minor cities were located. Scores of "special wires" ran down the walls from the roofs of the buildings to as many telegraph keys. Over these wires millions of words were transmitted to practically every daily newspaper in the country. It is safe to say that the tolls collected by the telegraph companies in payment of despatches from Newspaper Row have been great enough to pay the cost of construction of a new copper wire line from Boston to San Francisco.

Five or six years ago the Occidental Building, which was a perfect hive of newspaper men, was torn down to give place to a modern office building originally intended for newspaper correspondents. But the owner secured an advantageous offer from the Department of Commerce and Labor and "The Row" was doomed.

A year ago the building erected on the corner of Pennsylvania avenue for the Baltimore and Ohio Telegraph Company—consolidated with the Western Union two decades back—was sold to a syndicate as the site of a new hotel. The few remaining correspondents were notified to leave, and one by one they vacated the old building. On the first of November the last one left, and Newspaper Row passed out of existence.

The first despatch by wire from Washington to a newspaper was sent in 1853 by William B. Shaw to the New York Herald. Col. Shaw is still alive and still an active news gatherer. He was soon followed by Horace Greeley, James Watson Webb, Henry J. Raymond, John W. Forney and other men whose names were household words just before and during the Civil War. Telegraph tolls were very high, however (Mr. Bennett paid more for the transmission of the first fifty words of "press" than he pays for a whole column to-day), and it was not until 1861 that anything like a heavy service was sent out by wire. Only the briefest notes were telegraphed. Everything of length was sent by mail, and usually the signature or the nom de plume of the writer was printed below the article.

As showing the growth of the telegraph news service from Washington I would call attention to three periods. On the night of the assassination of President Lincoln in 1865 the total number of words telegraphed describing that first great Presidential tragedy was 75,000. When President Garfield fell as a result of Guiteau's shot on July 2, 1881, the first day's press business ran up to 248,000 words. On the day after the second inauguration of President Cleveland the Western Union handled the enormous total of 640,000 words of "press." Since that day the press associations have extended their field enormously, and it frequently happened, no doubt, that the total number of words transmitted from Washington to newspapers has reached and passed the million mark.

Some queer queries have come to the men of newspaper row. Every school boy knows that the final session of each Congress comes to an end at noon March 4, on each "odd year." Managing editors don't always know as much. Along about February 15, 1887, Herbert Preston, of the New York Herald's bureau, received a telegram which read: "Wire your opinion as to the probable date of adjournment sine die." Preston replied: "Unless all precedents and the Constitution are violated Congress will adjourn at noon March 4."

In 1877 the late Eugene B. Wright was the representative of the Chicago Tribune. In those days great rivalry existed between the men of the row, and extraordinary efforts were made to scoop each other on important official news. Great anxiety was manifested all over the country to learn what President Hayes would say in his first message to Congress. Four correspondents, one for New York, one for Chicago, a third for Cincinnati and the fourth for a St. Louis paper, formed a combination and made an arrangement with an employee of the government printing office whereby they agreed to pay $1,500 for an exclusive advance copy of the message. Wright was not the Chicago man in the combination, but during the evening that the "great scoop" was being sent out he passed down Fourteenth street and noticed the four correspondents with their heads together. He suspected that something important was in the air. He got busy with his own special wire which extended from New York to Chicago, via Washington. Before midnight arrangements had been perfected with the Western Union for eight wires from New York to Chicago, and the New York correspondent of the Tribune was on the lookout for the first edition of the New York Times. He secured a copy about 1 A. M., and within an hour President Hayes' message had reached the Chicago Tribune office and was in type for that paper's mail edi-

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tion. The Chicago Times, which was one of the four newspapers in the combination, held back its story to assure its exclusiveness and missed the early trains. The Times refused to pay its share of the agreed price and the printer never succeeded in collecting that portion of the pay for his treachery.

During the autumn of the first year of Cleveland's first administration a Buffalo newspaper wired its correspondent to this effect: "Interview President; ask if he will vote for Democratic nominees; Solomon for mayor, Patrick for controller," and so on down the entire list to the most insignificant name on the ticket.

When "Dan" Lamont saw the despatch he grinned and softly hummed a bar from "Pinafore" which sounded like Sir Joseph Porter's 'I always voted at my party's call and never thought of thinking of myself at all." That was the answer.

The St. Louis Republic had as its correspondent some years ago one of the most active and industrious of men. He had to keep a wire "loaded" from 6 P. M. until midnight and sometimes the work was difficult. One day he made several attempts to see a certain Senator to interview him on a subject in which the Republic was deeply interested. He failed to locate the statesman but about nine o'clock his attention was called to an interview with the very man in a Baltimore paper. Hastily scribbling an "introduction" he explained the difficulty he had experienced in locating the "interview," closing with: "The Senator was finally found at the residence of a friend on the outskirts of the city," and said: Then he pasted on the clipping from the Baltimore paper and went around the corner.

The telegraph operator proceeded with his task in a mechanical manner. He paid no attention to the meaning of the despatch and when he reached the quotation marks he proceeded: The Senator said: "Eggs steady and in fair demand. Butter firm and stronger; receipts light. Apples higher. We quote—"

Then came a break in from St. Louis: "We don't care a blankety blank what the Senator knows about the Baltimore markets. We have 'em in the office already." You see the correspondent had pasted the clipping wrong side down on his copy.

"Interview Michigan delegation on apostacy of Ex-Mayor Wheaton" was the order received by the correspondent of a Detroit newspaper in the middle '80s. But the Michigan delegation didn't care to be quoted. Summer Howard, a then well known politician, was in town, however, and the correspondent in despair sought him in his hotel. "So Wheaton has flopped," said Howard. "Well, I'm blessed glad of it. You see, Wheaton was always the fly on the bull's hide a little too far back to reach with the tongue and a little too far front to switch with the tail." And that simile went all over Michigan.

Perhaps the most remarkable despatch ever received in a newspaper office came from, no one knows where. Peck of Chicago, Miller of Seattle and Detroit, Van Antwerp of Minneapolis, and Hamilton of Buffalo, were sitting in their joint office on newspaper row on Sunday morning, May 1, 1898, planning the day's work, when Peck said: "I have just heard a rumor to the effect that Dewey has sailed into Manila Bay and has destroyed the entire Spanish fleet with the loss of one of his own ships and 300 men."

"Where did you get it?" exclaimed the others.

"I cannot explain it," said Peck, "and I don't take much stock in it, but there you are."

An examination of the files of the Buffalo Times, Seattle Times, Albany Times Union, Minneapolis Journal and various other papers of May 1, 1898, will show the reproduction of that rumor in special editions, but no one was able to get a word in confirmation of the report until several hours after, and no one has ever been able to find out where it started, for Marconi was unknown in those days.

Speedy Foreign Messenger Service.

Sergeant Williams Bevan, of the district messenger service, London, England, is only sixteen, and small for his age, being known among his intimates because of this as "the Bloomsbury giant."

On Friday evening, December 15, 1907, he received a call. Answering it he received an order, brief but pointed: "Take this letter to this address in Berlin, get it signed for, and bring back an answer. Don't be long away, as we're busy."

Off without question went little Bevan. The time was 7.45 P. M. He had to catch the 8.35 P. M. train from Holborn Viaduct to Queensborough, going to Endsleigh Gardens first for his ticket. He did it without stopping to take anything but a clean shirt, collars, and an overcoat. When he reached Flushing he was a little poorly from sea-sickness, for the sea had been heavy, but he at once boarded the train for Berlin, which he reached at 7.20 on Saturday night.

He was quite unable to speak German, but hailed a cab, showed the driver the address on the letter he was carrying, and was at once driven to a well-known club. Here he delivered his missive into the hands of the gentleman it was intended for. His coolness, his uniform, and his small size attracted great attention, and the clubmen, many of whom could speak English, made much of him.

He was taken round in a cab to see the sights of Berlin by night, as he desired to do, and then went to sleep at a hotel. Next morning he was at the club betime to get the answer to his message. When he got that he spent the time until the train started at the Berlin Zoo. Then he repeated his journey across Germany and Holland, caught the boat, and was back in London by half-past nine on Monday night, having beaten the quickest postal route by some five hours.

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The Telegraph System Across Africa.

When Cecil Rhodes was dreaming his dreams and drawing out his plans for development undertakings of wonderful proportions in Africa, he laid the foundations of many great works, the completion of which he never lived to see. In regard to most of these projects, it still has to be said that the time for their completion is not yet arrived and will not be for years to come.

It was Rhodes whom we believe Professor George Forbes was able to first interest in suggested schemes for the utilization of the Victoria Falls years and years ago, before electrical transmission was commercially practicable to anything like the distances that obtain to-day. Recent efforts to interest the British public financially in this matter have shown that it is anticipated that at some time or other a pretty substantial value will attach to this electrical concession.

Rhodes had as a very important work in connection with all his African development schemes, the establishment of a system of telegraphic communication from the Cape to Cairo. And, as was the case with so many of his ideas, he showed his belief in the promise of future success in helping in the development of the great continent that he handled it more as a personal scheme. He and his friends found the money, though the possibility of getting any return for many years was quite out of the question; and the doings of the African Transcontinental Telegraph Company, Limited, formed to construct the system, were directly under his guidance. In May, 1898, he was saying: "They could not expect to make any profit until they got through to Cairo, for he did not think the local returns would pay."

Six years ago Rhodes died. He had made arrangements with the German government for the construction of the line through German East Africa, and of certain branch lines in that territory and for the working of such lines. Also for the other parts of the system he had made working arrangements with the British South Africa Company. But many things have happened since the work commenced which have had adverse effects upon the undertaking. For instance, the high submarine cable rates (in 1902 eight shillings and eleven pence per word) have been reduced to two shillings and six pence per word, and this reduction, of course, was a great obstacle in the way of raising further capital for a transcontinental line. The work has, however, been gradually going forward in spite of enormous difficulties. The total length of constructed line is 1,584 miles, made up of 1,389 miles of trunk line from Umtali to Ujiji, and two branch lines, one of 128 miles to Fort Jameson and one to Chiromo of sixty-seven miles.

Telegraph lines are being gradually brought down from Egypt and the north, and it is expected that in the course of time gaps now existing will be filled and a through line established. Further connections with coast towns such as Mombassa and Dar-es-Salam, and the gradual development of the whole of Central Africa, are expected to add local traffic, but it is admitted by those in control of the undertaking to-day that "a long time must elapse before it can be hoped to make the line self-supporting or profit-earning."

It will easily be gathered from a glance at the map indicating the route followed that the construction of the line has been a work of enormous difficulty. There are the natural difficulties presented by the diversified physical characteristics of the country traversed, which includes low-lying marsh lands, swamps, dense forests and jungle and mountainous regions intersected with deep and wide ravines. To all this we may add the difficulty of procuring and maintaining transport in a sparsely populated country; varied and trying climatic conditions along certain low-lying portions of the route, scarcity of water in some of the high altitudes, and damage done to the line as it progressed by elephants, giraffes and other wild animals.

The route of the existing line from Umtali up to Ujiji may be traced out as follows: From Umtali, in Southern Rhodesia, through Tete, in Portuguese East Africa, where it crosses the River Zambesi to Blantyre, in the British Central Africa Protectorate; thence along the western shore of Lake Nyasa through Domira Bay and Florence Bay to Karonga, where it leaves the lake and strikes a northwesterly course across the Tanganyika plateau, through Fort Hill, Nyala, Ikala, Fife and Abercorn to Kituta, which is on the extreme southeastern shore of Lake Tanganyika. From Kituta it proceeds in a northerly direction, roughly parallel with the lake, but a few miles to the east of it crosses the Kalambo river into German territory and passes through Bismarckburg to Ujiji. Here construction has ceased and a station for the receipt and transmission of telegrams has been opened.

The extreme difficulty of the territory north of Ujiji has led to proposals that for a certain distance connection shall be made here by means of wireless telegraphy. In German East Africa, indeed, there is a gap of some 320 miles, and there are shorter gaps at one or two other points between Cape Town and Cairo, and, while it is still intended that the whole thing shall ultimately be completed in accordance with Cecil Rhodes' plans, the Duke of Abercorn and his associates despair of bringing the undertaking through as a commercial enterprise.

It may be of interest to mention that in the will of Mr. Beit a sum of at least $6,000,000 was left to be devoted to improving means of communication in the Cape Cairo region, and telegraph and telephone lines and wireless telegraphy are all specially mentioned. It has been sug-

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gested that part of that sum might reasonably be put toward the completion of this transcontinental telegraph system.—Albert H. Bridge, in the Electrical Review.

Recollection of the Railroad Wreck at Ashtabula.

"It was thirty-one years ago on December 29, 1907, that I sent one of the most pathetic messages that I ever handled. I wasn't very old, then, and I was an operator in the Lake Shore-Western Union office in Erie," said D. T. Murray, of Youngstown, O., now a division superintendent of the Lake Shore system.

"It was just a little bit of a yellow slip of love and greeting from a man who stepped off a train to flash it to his sweetheart in San Francisco. He was on his way as fast as the slow trains of that day would carry him to the West. I remember his face—clean cut and a young man of power. Then—

"Oh, it was days afterward—possibly months—that there came back to me a pathetic little letter from the girl he wired. Would I give her the original message he had sent on that day? Would I give it to her? Yes, certainly. I had been promoted to chief despatcher then and after some red tape she got it. Poor boy! Poor girl! He went over with the train at Ashtabula when the bridge went down. He must have been worthy of her and she of him but none will ever know it now."

Mr. Murray went on with his narrative: "I wasn't as old as I am now. I took the trick early, that night at Erie. There was snow there several feet deep and I was rushing eagerly to the office. I lost a shoe on the way there, and, by the way, I found it the next April when the snow melted. I was at the wire when the accident occurred and then came the order for all operators to be rushed to Ashtabula. People before that had been offering $20 gold pieces to find out the fate of loved ones. It couldn't be done. They were all there in the bottom of the river by the dozens, including many people of national reputation and men prominent in business in Chicago, Cleveland and elsewhere. Among those so lost was P. P. Bliss, the well known writer of gospel hymns.

"Across the river it was but a step to the telegraph office in the old station, now torn down, and there we were located for the work. There were three wires and twenty operators. We sat idle some of us for an hour or so until they cut in the other wires. They were all tapped and soon every man of us was sending, sending, sending. The correspondents swarmed down on us like fleas. They came from everywhere and the pile of messages before us was something awful.

"A new correspondent would get in town and in five minutes would be writing a column. The people from all over the country were flocking to Ashtabula to look for loved ones. The hotels would not accommodate them. They were frantic—wild—raving. It was an awful wreck."

Canadian Postage Rates.

Newspaper publishers in the Province of Quebec have petitioned the Dominion post office department to restore the old rates on newspapers and magazines between the United States and Canada, a six months' trial of the new rates having proved the injurious effects to the Canadian press and people. The Montreal French Chamber of Commerce has also urged the repeal of the new regulations, and its committee appointed to look into the matter has reported that any restriction placed on the circulation of Canadian papers in the United States and in other foreign countries would prevent the country from being known and appreciated; that it would tend to neutralize the patriotic efforts of the Canadian press, and that it would unfavorably affect immigration to Canada as well as the repatriation of French Canadians. Persuaded that in the interests of colonization and commercial prosperity the country needed far more advertising than was given to it in the press, the Chamber of Commerce has requested the federal government to further such advertising by the creation of a commercial museum and the distribution of explanatory guides on the resources of Canada. The committee states also that the circulation of American magazines is of great advantage to trade and industry, both from a scientific and from a news standpoint, this having particular reference to the technical and trade press. The sharp increase in the rates of postage necessitated an advance in the subscription price of copies of Telegraph Age going to the Dominion from $1.50 to $2 a year. The United States government through the postmaster-general expresses a willingness to restore the old rates of postage if the Dominion government will take the initiative in the matter, as it was the Canadian authorities that demanded an increase in the rates.

At a recent after-dinner speech in London, Henniker Heaton, after referring to "the God-given gift of electricity now in the hands of a few monopolies," is reported to have said, according to a London paper, that, "incredible as it appears, there are thirteen cables from England to America, and eleven of these are kept idle by the cable ring or cable kings." After such a statement he was naturally in favor of the governments' buying out the "cable kings" at the market price, and giving the cables over for the use of the people forever. We may mention that there are sixteen cables to North America from Europe and three cables to South America, thus making at least nineteen; and the idea of cable companies laying down cables and subsequently keeping them idle, will appeal to anyone with business instincts as being, to say the least of it, ridiculous. After all, however, it occurs to us that Mr. Heaton may have been referring to "wireless cables," which at present seem to be rather idle.

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Train Despatching in the New York and Brooklyn Tunnel.

One of the most novel devices in existence was put into practical service for the first time on any railroad to insure the safety of passengers when the Battery tunnel from New York to Brooklyn was opened a few days ago.

Seated at a table at the extreme south end of the Bowling Green station platform, a young man with a telephone fastened to his ear and his right hand upon an emergency signal, had constantly before him an illuminated model of the tunnel on which, by means of moving shafts of red light, he can trace the passage of each train and can instantly locate the exact whereabouts of every train in either tube between the two boroughs named.

This model, an exact reproduction in miniature of the two tubes under the river, is contained in a small black cabinet not more than three feet in length and a foot and a half in width, and the two tubes are represented by two curving streaks of green light which stretch across the dark glass front of the cabinet. These shafts are an exact duplicate of the tubes, showing the deviation in curves, the seven blocks into which the tube has been divided, the location of the ventilator shafts, etc.

When the tubes are clear the entire shaft of light shows green for its full length. The moment a train enters any block between Bowling Green and Borough Hall, Brooklyn, the green light in the block in which it enters gives way to a red light on the miniature model. As the train passes from block to block on its way through the tunnel, its course may be traced by the progress of the red light. The red light in one block vanishes the moment the train enters the next section, so that no single train is ever indicated in more than one block at a time.

On the tiny colored model, both the north and south tubes are represented, the distance carefully brought to a scale and the length of each block carefully marked off. There are seven blocks in each tube. In both of these tubes the same safety block system is in operation that is used in the rest of the subway, with many additional devices added to make the under river section all the safer.

The first block south of the Bowling Green station toward the East River is 900 feet in length, the second 600, the third 1,200, the fourth 2,400, the fifth 1,400, the sixth 850 and the seventh, which is near the Borough Hall station, is only 450 feet. The fourth block is located under the middle of the river, and comprises a long straight stretch where trains are expected to move rapidly.

As a train starts for Brooklyn the contact of its wheels with a circuit causes the first block on the south tube, as shown on the miniature model before the despatcher, to go red. The moment this train passes out of the first block into the second the circuit is broken, and the light in the first block goes back to the original green, while that in the second block goes red, and so on through the tunnel.

Under the system of operation that is planned there must always be one empty block between trains in motion, except at the blocks near Borough Hall and the Bowling Green stations, where it is thought safe to bring them closer together.

The despatcher at Bowling Green station, with this illuminated model of the tube, will be complete master of every train passing between New York and Brooklyn. To his ear will be attached a telephone, which connects with numerous other telephones located every 300 feet, through the two tubes. At his right hand is an emergency switch, and by a mere turn of his hand he can instantly bring to a standstill every train in the subway. At any moment the model shows two trains to be occupying the same block, or to be in dangerous proximity, or when the telephone tells him of any trouble, he can by a turn of the wrist turn off all the power in both tubes and stop all trains. The lights in the tube, however will not be extinguished. The moment this is done the operator will immediately locate the trouble, and when it is found to be confined to one tube he will call up the central power station and order the power turned on again.

Though any trackwalker, workman or other person in the tube can turn off the power by smashing one of the glass-covered emergency alarms and pressing the button, only a recognized official of the road can order the power turned on again. In order to have the power turned back the employee or official must give his full name to the operator at the central power station and the number of his pass, so he can be fully identified. This is to prevent the turning on of the power suddenly and when not expected by persons in the tube.

Extraordinary precautions have been taken to provide against fire in the tubes or, if there should be fire to clear the tubes quickly of smoke. At the Battery terminus of the tunnel and at the Joralemon street end in Brooklyn, close to the river are two huge shafts. In these are stationed enormous fans, which though officially stated to be for ventilation, are really intended to quickly clear the subway of smoke in case of fire.

Five cars can be run in each tube at one time, making ten trains in operation between Bowling Green and Borough Hall at once. The regular time, as shown on the time tables which have been prepared, is five minutes between the two stations.

The illuminated model has been devised by the engineering force of the Interborough, and it is believed it will make the Brooklyn tubes the safest in the world.

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$1.50 a year.

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A New Western Union Office at Augusta, Ga.

A new office has recently been opened in Augusta, Ga., for the Western Union Telegraph Company. It is situated at 745 Broad street, next door to the former office, which was destroyed by fire some months ago, occupies the entire ground floor of the building, having a frontage of thirty-two feet on Broad street and running back a depth of one hundred and fifty feet. The ceiling is eighteen feet high and of stamped steel, painted white. The walls are a very light pea green, giving a nice soft light to work by. The entire front of the building is glass. The public lobby is twelve by twenty-five feet and paved with encaustic tiles, having the letters W. U. T. Co. in the center, making a neat and handsome appearance. The counter is massive and made of dark oak finely finished, and has a blind top. In the lobby are two handsome heavy oak desks, each with space to accommodate two persons at the same time, and comfortable oak chairs are provided at each for the use of patrons. Behind the counter is a space twenty-two by twenty-eight feet for the manager, bookkeeper and clerks, with a suitable room railed off for call bell cabinet and the messengers.

The operating tables consist of ten new oak sextettes, all equipped with typewriter cabinets, and placed in three rows. There are also two repeater tables which accommodate eight sets of quadruplex, eight sets of Atkinson single repeaters and four half sets of the same class of repeaters. The office also has two full sets of quadruplex and four sets of duplex, with twenty-five single sets of instruments on regular tables. The switchboard, in two sections of fifty wires each, is located near the west wall, midway the operating department, and is of the latest pattern, set in a fine oak frame, with plenty of space all around it. In the northwest corner of the room is the motor generator and the charging board for the storage battery, which consists of seven hundred and forty cells. Adjoining the operating department, in a large room, is located a bank of lockers for the use of the operators, a file and stationary room, and the necessary conveniences in the way of toilet rooms for the employees. The office is steam heated, and equipped with electric lights and a reserve of gas fixtures.

The arrangement of the office is the work of S. R. Crowder, electrician of the southern division, and it is needless to say it has been artistically and splendidly done in the most up-to-date style, and it has been highly complimented by patrons and the public.

The company has seventy-two main wires and thirty odd loops at this place, and is now as well equipped to handle business here as at any point in its system. The local officials are: J. W. Brown, manager; G. W. Hammell, chief operator; A. Potter, wire chief; B. H. Rosson, traffic chief; W. E. Seward, night chief, with Charles Smith, assistant.

The total force, including officials, operators and all clerks, numbers thirty-five, not including repair and messenger departments.

New Western Union Office at Nashville, Tenn.

The transfer of the plant of the Western Union Telegraph Company at Nashville, Tenn., from Church street to the Stahlman Building, was accomplished December 21, last. The operating department of the new plant, occupies nearly half of the twelfth floor of the building, and the business office about the same space in the basement. The entrance to the business office is on Third avenue, and the office is entered by descending a flight of marble steps.

With the installation of the new plant Nashville attained the distinction of being the location of the most complete telegraph plant in the South, and one of the best equipped in the country. The quarters are commodious and artistically equipped. The business office is fitted in marble and mahogany. Marble desks are provided for the convenience of the patrons of the office, and a marble partition divides the lobby to be used by the public from the desks of the clerks and attendants. Each desk is equipped with an incandescent light and these, with the lighting effects in general, give the office an artistic appearance, thoroughly in accord with the building. The operating department on the twelfth floor is furnished in oak and equipped with every comfort.

The equipment includes eighteen dynamos, ranging in voltage from six to three hundred and fifty. The work, both of design and installation, was done under the supervision of S. R. Crowder, electrician of the Southern division. A. H. Stewart is the manager of the office.

Governor Hughes Would Place Telegraph and Telephone Companies Under State Supervision.

In his message to the present Legislature Gov. Hughes, of New York, says, regarding the act providing for the regulation of companies furnishing certain classes of public service: "I recommend, however, an enlargement of the scope of the act. In view of the tasks to be assumed with respect to corporations already under supervision, it was not thought best at the outset to extend the act to other corporations. It should now be extended to telephone and telegraph companies and they should be brought under appropriate regulation as to rates, service and other matters similar to that which obtains in the case of the corporations at present subject to the law."

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The Bogus Presidential Proclamation During the Civil War.

The bogus Presidential proclamation which appeared in May, 1864, during the Civil War, calling for 400,000 men, an emanation of the inventive brain of Joseph Howard, Jr., a journalist, of New York, has frequently been adverted to in these columns, because of the supposed complicity of one of the existing telegraph companies at that time, in its dissemination. Mr. A. W. Orton, of Rome, N. Y., a well-known old time and military telegrapher, and manager at the time named of the office of the telegraph company involved, located in the financial district, New York, was recently interviewed regarding the affair by the Rome Sentinel, the whole presenting a story so interesting that we republish it in full, although a portion, of what appears has already been published substantially in Telegraph Age:

"The first that President Lincoln or any of his cabinet knew of the matter was when it was published. It proved to be a fake pure and simple, and was one of the greatest hoaxes ever published. It developed that the proclamation was the work of Joseph Howard, Jr., a newspaper correspondent, and a forceful and fluent writer, who was well acquainted with the phrases peculiar to the President and the style of copy then in vogue by The Associated Press, by which organization the proclamation purported to have been sent out. The fact of the matter was that The Associated Press had nothing to do with it and it had never been sent over their wires or any other. In these days it would be impossible to perpetrate any such hoax, for each newspaper taking Associated Press dispatches has a wire running into its office and its own operator at the key. During the Civil War and for many years thereafter, dispatches were received at the office of the telegraph company like all other messages, and delivered to the newspapers by messengers. There were no seperate newspaper wires, as there are now. This being the case it would seem to be a comparatively easy matter for a man like Howard to send in a bogus message on the regular press blanks of the telegraph company and have it accepted. As a matter of fact, however, only two of the New York papers were caught the World and the Journal of Commerce. The others got on to the hoax, some before their papers went to press and the others in time to suppress the edition which contained the matter. As soon as possible after the objectionable publication was made, the United States authorities seized and closed the offices of the World and Journal of Commerce, and also numerous offices of the telegraph company supposed to have been instrumental in sending out the proclamation. Mr. Howard and the telegraph operators handling Associated Press matter were likewise arrested and sent to Fort Lafayette. The case was fully investigated within a few days, and the newspapers were absolved from blame. Ultimately all the men connected with the affair were released without further punishment.

"Telegraph Age, of New York, has recently published several articles in regard to this bogus proclamation, the story of which is very readable. But there is a local color to this bit of history which has not been touched upon or mentioned by the Age, and which adds immensely to its importance. It is stated in the Age that Mr. Howard, the author of the forged proclamation, was without a confederate. This is incorrect. There are many residents of Rome who have distinct and clear recollection of a young man named F. Avery Mallison, who was Joe Howard's confederate in getting out the proclamation, and who was arrested and imprisoned in Fort Lafayette for his offense. "Ave" Mallison, as he was familiarly called, was keen and bright, his greatest delight was a practical joke. He was an early telegrapher, and before 1856 was manager of the telegraph office in Rome. Mallison's assistant in that office was Timothy Alexander. Mallison and Alexander have long since passed away.

"In 1856 Albert W. Orton, who is a resident and business man in Rome, became the messenger in the telegraph office. The first year he received the munificent salary of $50, and for the second year he was paid $75. The second year he slept in the office, opened and swept out the store in the morning, and did the most of the telegraphing, besides carrying the messages. After that he went to Albany and was telegrapher for the late Chauncey Vibbard, superintendent of the Central Railroad. Subsequently he was with the late Samuel Sloan, who was president of the Hudson River Railroad, and whose office was in New York. This was before the consolidation of the Central and Hudson River roads. From Albany he went into the military telegraph service in the Civil War. A part of the time he was at the front, and the rest at Washington. He was well acquainted with Secretary Lincoln, Secretary of State Seward, Secretary of War Stanton, and other members of the cabinet. From the war service he went, at the solicitation of friends, to New York, where he was given the position of manager of an office in Wall Street. He was there in May, 1864, when the bogus proclamation was published, although he had nothing to do with it and got into no trouble over it. He was on the day trick and left the office at 4.30 in the afternoon, while the soldiers did not take possession till 8 o'clock at night. Mr. Orton has a very vivid recollection of the bogus proclamation episode and the results. In an interview he says:

"At the time of the proclamation hoax there were two telegraph companies with lines connecting between the eastern cities, New York, Boston, Philadelphia, Baltimore, Washington and Pittsburg being the principal stations. These were the American Telegraph Company, the president of which was Col. E. S. Sanford, and the Independent Telegraph Company, whose president was James J. Speed. The president of the American line was, as I remember, appointed by the government military censor of telegrams

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passing over their lines. The Independent was a new company and a competitor of the American line. The New York main office was at 28 Nassau street. The manager was Wallace Leaning, who for some time had been a prominent figure in New York telegraph circles, owing to his proficiency as an operator. A. N. Aplin was assistant or chief operator. This company had a branch office in the Wall Street district. It was located at the corner of William street and Exchange place, in the rooms known as the Gilpin Exchange, where the gold markets were held, the office being partitioned off inside the main or trading room. Of this office I was the manager and I had several operators on my force.

"After the bogus proclamation came out Gen. John A. Dix, who was the commanding officer over the military department, which included New York City, acting through orders from the Secretary of War, Mr. Stanton, had the offices of the New York World and the Journal of Commerce seized by the military, guards being placed inside and outside. Guards of soldiers under command of Col. Ludlow took possession of the Independent Telegraph offices, arresting the managers of all the office forces found at work in New York, Philadelphia, Washington and Pittsburg. At 28 Nassau street, New York, Wallace Leaning, A. N. Alpin and three other operators, Fish, Johnson and Edwards, were arrested on the evening of May 18. The day force had left the office, which reduced the number to Mr. Leaning and the four operators. After searching through the files in the office and the pockets of the employees, the men were ordered by Colonel Ludlow to form in line, and were marched out and put into carriages and driven to the Park Barracks, which occupied the site of the present New York postoffice. They were placed in the officers' headquarters under guard. Manager Leaning was then driven to General Dix's headquarters in Bleecker street. After a short interview he returned, and it was evident that his mission was unsuccessful as to the men being released. They were again ordered to move. They were taken to the Battery and placed aboard the police boat Berden, which was waiting to receive them, and it was then evident that one of the government harbor fortresses was to be their destination. The night was dark and the rain began to descend in torrents when the little boat was made fast to the lee of the gloomy fortress at Fort Lafayette. While the telegraph company was innocent of any wrong doing, it was put out of business for the space of eight days. The operators had for companions secessionists, pirates, blockade runners and bounty jumpers. They were released on Saturday night.

"Another file of officers and soldiers was marched to the company's branch office, corner of William street and Exchange place, about 8 o'clock on the same night, with orders to arrest office force, and especially the manager, and seize office and equipments. The soldiers, with bayonets fixed, had full possession from evening of the 18th until Saturday, the 24th of May. This branch office being the Wall Street branch, the hours were from 8 a. m. till 4.30 p. m., which permitted the office force to escape the arrest and imprisonment that was meted out to the employees at the other offices in New York. The managers and operators arrested in Philadelphia, Washington and Pittsburg, were marched through the streets to the depots and sent to Washington, where they were confined in the Old Capitol Prison. It turned out that the guilty party was a man named Joseph Howard, who had been a prominent reporter for the New York Times. At the time of the bogus proclamation he was connected with the editorial or reporters' staff of the Brooklyn Eagle. Howard was afterward arrested and confined in Fort Lafayette. The proclamation never saw the inside of any telegraph office. It was believed that the proclamation was got out to influence the trend of the markets in Wall Street, but the hoax was discovered between the time the New York papers were published and the opening of the markets, which destroyed any effect upon gold or securities.

"Why the authorities selected the Independent Telegraph Company as the probable cause of the issuing of this proclamation no one seemed to know, but the orders came through Washington influences. The government at Washington, as a partial compensation, and to show its good faith, through President Lincoln and Secretary Stanton, granted equal government privileges with the other company and directed that the Independent line should receive its share of government patronage. The president of the Independent line, J. J. Speed, received the following letter:

"'Washington, D. C., May 29, 1864.

"'Sir: The investigation by this department relieves your company from all suspicion of being concerned in the transmission or publication of the recent forgery purporting to be a proclamation by the President and attested by the Secretary of State.

"'The satisfactory arrangements made with your company will, I trust, do much toward impressing the public with a just confidence in your telegraph lines and the loyalty, prudence and discretion of its management.

"'(Signed) Edwin M. Stanton,

"'Secretary of War.'

"Guards were promptly withdrawn, the telegraph company's officers released, property restored and the company resumed business again.

"On the release from Fort Lafayette, Mallison, the confederate of Howard, in giving his experience in the celebrated American fortress, where he spent four months at the expense of Uncle Sam, said: 'Of rations there were three grades, viz.: The soldiers, the prisoners, and the retaliatory; the prisoners being two degrees below and composed of the leavings of the soldiers' rations.'

"Colonel Burt, the commandant of the fort, was formerly with General Scott in the Mexican War,

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and had charge of the execution of death sentences on deserters. In his hours of inebriety his mind would run almost entirely upon shooting people. Such instances as the following occasionally occurred: About one o'clock one dark night 'Ave' was aroused from his slumbers by a corporal and a guard and hurried before the colonel, who addressed him this wise: 'Young man, your case is an exceedingly hard one. Young, talented and of respectacle connections, you have abandoned all for a path of infamy. I am at loss whether to send you to the Dry Tortugas during the war or to have you shot in the morning. On the whole, I think I will have you shot. Adjutant, set that down, shoot him at 6 in the morning. Young man, how many balls would you think proper, six or eight?'

"'Ave,' who understood it, said: 'Being a small man, I think six would be sufficient.'

"Said the colonel to the adjutant: 'Set him down for six balls at six in the morning. Take him away and bring in another.'

"The order for Mallison's release was simple and concise: 'Release Mallison, the proclamation man.'

"The part that Mallison took in getting up the bogus proclamation was simply to write it out at the dictation of Howard. Mallison was such an inveterate joker that he probably thought that the publication of the hoax would be the funniest thing in the world. But to be shut up in Fort Lafayette for four months was anything but amusing. However, even in prison, Mallison's penchant for joking showed itself. I have found in the Rome Sentinel of July 26, 1864, the following: The Yonkers Gazette, speaking of F. A. Mallison, now in Fort Layayette for his connection with Howard in the issue of the bogus proclamation, says that Mallison freely expresses his wonder that Mr. Lincoln did not accept the proclamation as genuine, and father the document as his own. 'Why,' said he, 'if he had done that he would have had 400,000 men under arms by this time and marching into Dixie.' Perfectly sensible. Avery is in his right mind, as usual.

"Joseph Howard was released from Fort Lafayette in the latter part of August, 1864. His father made several trips to Washington bearing petitions signed by Henry Ward Beecher and other prominent men. Mallison was released the latter part of September, 1864. Mallison, like many other old-time operators, drifted from the telegraph fraternity, into newspaper work, for which he was well suited.

Nikola Tesla Makes a Forecast for 1908.

Nikola Tesla make a forecast which he says is not a prophesy. He writes:

"The coming year will be great in thought and result. It will mark the end of a number of erroneous ideas which, by their paralyzing effect on the mind, have throttled independent research and hampered progress and development in various departments of science and engineering.

"The first to be dispelled is the illusion of the Hertz or electro-magnetic waves. The expert already realizes that practical wireless telegraphy and telephony are possible only by minimizing this wasteful radiation. The results recently attained in this manner with comparatively crude appliances illustrate strikingly the possibilities of the genuine art. Before the close of the year wireless transmission across the Pacific and transatlantic wireless telephony may be expected with perfect confidence. The use of the wireless telephone in isolated districts will spread like fire.

"The year will mark the fall of the illusionary idea that action must diminish with distance. By impressing upon the earth certain vibrations, to which it responds resonantly, the whole planet is virtually reduced to the size of a little marble, thus enabling the reproduction of any kind of effect, as human speech, music, picture or character whatever, and even the transmission of power in unlimited amounts with exactly the same facility and economy at any distance, however great.

"The next twelve months will witness a similar revolution of ideas regarding radio-activity. That there is no such element as radium, pollonium or lonium is becoming more and more evident. These are simply deceptive appearances of a modern phlogiston. As I have stated in my early announcement of these emanations before the discovery of Mme. Curie, they are emitted more or less by all bodies, and are all of the same kind—merely effects of shattered molecules, differentiated not by the nature of substance but by size, speed and electrification.

The "Handbook of Wireless Telegraphy," by James Erskine-Murray, furnishes another contribution to the study and discussion of wireless telegraphy of a character such as to place this volume in the front rank of works dealing with the subject. It is a dignified and scholarly production. It furnishes a bright picture of the possibilities and the actual accomplishments of wireless telegraphy, yet the entire presentation of the question, comprehensive in its details, is treated in a simple, non-technical manner, well suited to meet the requirements of the student and the general reader. The history of wireless telegraphy is traced and a description of the appliances used for the product of high-frequency currents is given. The author makes a commendable attempt to set forth the problems of the laws governing transmission of signals to long distances and of the losses that occur through atmospheric absorption or other causes. The codes used in this country and those abroad, together with tables of electrical constants, are given. The book is bound in cloth, contains 332 pages, and is illustrated. Its size is 5½ by 8½ inches. It will be sent postpaid on receipt of price, $3.50. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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Mr. Gifford Refers to the New York, Albany and Buffalo Telegraph Line.

Sidney B. Gifford, of Syracuse, N. Y., was a skilful telegrapher, and for many years active in its service, is a lovable character and an exemplary citizen. His information respecting the telegraph is varied and extensive. No man, probably, is more familiar with the history of its beginning and development in Central New York than he, for his own connection was contemporary therewith. Beginning as an operator at the key, he retired from the service with the rank of superintendent of the Western Union Telegraph Company, completing a long and honorable record. In the quiet of his home he is fond of meeting members of the craft, old time associates, with whom he is always ready to engage in reminiscent conversation.

In referring a few days ago to the building of the New York, Albany and Buffalo Telegraph Company, now long since incorporated with the Western Union system, he said the work of construction began at Utica in the fall of 1845, and progressed simultaneously both east and west. The line reached Buffalo, its western terminus, July 3, 1846, and was completed through to New York September 9, of the same year. It is interesting to note, on the authority of Mr. Gifford, that the more important initial offices along the line were opened at places and on dates, all within the year 1846, as follows:

Albany and Utica, January 31; Syracuse, May 1; Auburn, May 25; Rochester, June 1; Troy, August 7; Hudson and Rome, October 28; Geneva, November 9, and Schenectady, December 6. Canandaigua and Batavia came later.

The Geneva office was established in the fire engine house in that city with Park Fellows in charge. This information as to Geneva Manager Steigelmann, Mr. Gifford said, found in 1876 in an old Geneva newspaper.

The first telegraph office in Syracuse was located upstairs in the railroad depot, which was built over the tracks and which extended from Salina to Warren streets. B. F. Partridge was the first operator at Syracuse.

John D. Stone, who was a printer in Auburn when the office in that place was opened by Edward F. Barnes, went to Rochester in July to assist Mr. Barnes, who was then manager in that city. Subsequently Mr. Stone opened the Schenectady office, and later went to Syracuse, March 13, 1848, where he remained until August, 1868, when he left the service. The late James D. Reed when engaged in 1875 and 1876 in the preparation of his book, "The Telegraph in America," sought Mr. Gifford's aid when hunting for material relative to the early history of the New York, Albany and Buffalo Telegraph Company, and found the assistance Mr. Gifford was able to furnish to be of great value.

In a recent letter addressed to E. Payson Porter, of this city, by Mr. Gifford, the last paragraph concludes with this bit of old time reminiscence: "I well remember you were at Geneva, N. Y., in May, 1850, when I started in here (Syracuse), and on August 1, 1851, went from Geneva to a point unfortunately having escaped my memory."

The Telegraph in Brazil.

In a recent report on the trade of Brazil, the Austro-Hungarian Consul at Rio de Janeiro states that the telegraph system of Brazil has rapidly developed during recent years, and there are at present 60,000 kilometers of land, sea, and river lines and cables. The government telegraph lines have a length of 27,349 kilometers, with a total length of wire of more than 50,000 kilometers, and 3,331 telegraph stations. Special attention during the year 1906 was paid to the extension of the landline 2,100 kilometers long from Rio de Janeiro to Cuyaba (Matto Grosso) to the Acro district and San Antonio on the Maderia river, and from there to the capital of the State of Amazonas. This town (Manaos) is at present only united to the Brazilian system by the line of the English Amazonas Telegraph Company and the river cable in the Amazon river to Belem de Para. By this extension a new, shorter and more convenient direct line would be established between the north and the federal capital of Brazil. The Acro district has at present no telegraphic communication, which is also true of San Antonio, for which town such a communication will become necessary as a result of the construction of the Madeira-Marmore Railway. The Brazilian telegraph authorities have now decided to construct the Cuyaba-San Antonio line with a branch to the districts of the Alto Acre, Alto Purus and Alto Jurusa, and a commission under the leadership of Major Rondon, has been sent out to lay this line, as well as to make investigations with a view to the construction of a railway in these districts. As the line of the Brazilian Government has already touched the border of Paraguay in three places, endeavors are being made to establish direct communication between that country and Brazil. Of the foreign telegraph companies established in Brazil, may be mentioned the English company "Amazonas Telegraph Company," which constructed a line between Manaos and Belem de Para, and received from the Government a yearly subvention of £17,125 for ten years from 1895; and the Western Telegraph Company, also an English company, which laid submarine cables along the Brazilian coast and to Europe.

It pays to start life as a telegraph operator, remarked an official of the Chesapeake and Ohio Railroad. He said that President Stephens, General Manager Doyle, General Superintendents Gryce and Knapp, Superintendent King, Trainmaster Wright as well as M. T. Spicer, chief clerk of the president, and several other minor officials all started to earn their daily bread as telegraph operators.

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Reminiscences in the Busy Life of an Old-Time Telegrapher.

BY JAMES F. GORMLEY, OF BOSTON.*

When the writer began his career as a telegrapher in the office at Hartford, Conn., in the early fifties, it was a time when the House printing telegraph system was in vogue. Hartford, then as now, was an important center, at that time one of the two capitals of the state, and its press specials formed no inconsiderable part of the telegraph business at that point. "The Courant," one of the oldest newspapers published in this country, printed important items of European news, hence it was, even at that comparatively early period, that intelligence from the incoming steamers was awaited with interest. News of this class, as so frequently has been described in Telegraph Age, was dropped overboard in sealed cans from incoming steamers when off St. John's, N. F., picked up by a waiting yacht of The Associated Press, hurried ashore and transmitted by wire to New York. This would reach its points of destination in the states in time for publication considerably in advance of the steamers arrival at Halifax, the first port of call. At this time D. H. Craig, the founder of The Associated Press, was the general manager of the association. The first items to come through would be brief mention in cipher embodying the general news, then would follow the market reports, the list of cabin passengers (not numerous in those days) and finally the ship news, enumerating the arrival and departure of vessels at foreign ports, in the movements of which the American public might be interested. When finally the steamer reached Halifax the news would come forward more in detail. The same American spirit of enterprise prevailed then as exists to-day in the prompt seizure of opportunity, and the ready adoption of means to an end.

The hours of business in the telegraph office at Hartford were frequently long and irregular, specially on "steamer days," and sometimes when "good night" was clicked off the valediction might very properly have been changed to the salutation of "good morning," so far as the hour was concerned.

At the time of which I write the manager of the Hartford office was W. O. Lewis, but he was soon called to New York to take charge of the Sandy Hook line, regarded as a very important circuit because of the marine intelligence despatched over its wires. Mr. Lewis was succeeded at Hartford by M. S. Roberts, who was the first "House" operator in that city.

Two of the lines of telegraph connecting New York and Boston were the New York and New England, or the "Bain" line, as it was called, and the New York and Boston Magnetic Telegraph Company, more familiarly known as the "Morse" line. The latter passed through Hartford. Eventually a merger of these two lines resulted in establishing the New York and New England Union Telegraph Company, usually called the "Union" line. Still another new company organized about this time was the American Telegraph Company. Following the tendencies of the day for consolidation, this company absorbed the Commercial, or the Boston and New York Telegraph Company. Behind this enterprise there were a number of heavy capitalists, including such men as James Eddy, of Portland; Hiram O. Alden, of Belfast, and others in the state of Maine, and Cyrus W. Field, Wilson G. Hunt and Peter Cooper, of New York. The acquisition of this New York connection when taken in conjunction with the Maine and Nova Scotia system, controlled by the same interests, and the line built by the identical parties in Newfoundland, provided a telegraph line under single control direct to New York, a route in its entirety of prime importance inasmuch as it permitted the quick handling of all foreign intelligence. A repeating station was established first at Hartford, but which was afterwards removed to Springfield, Mass. At Hartford there was a Grove battery of one hundred cups or jars. This was located on a different street from that on which the office was situated, and it was a part of my duty to connect it with the office every morning before eight o'clock, and disconnect it at night, after the conclusion of the day's business.

In those days there used to be a House line extending from New York to Buffalo. This was taken over by the Morse company, an act of merger that resulted in providing us with many additional operators. Among them was John Selden, into whose care was given the management of the repeating station at Hartford, succeeding George B. Prescott, who was transferred to Springfield. In the meantime M. S. Roberts went to New York with J. C. Hinchman, where both were employed on the Washington (House) line. J. W. Stancliff succeeded Mr. Roberts at Hartford. Another operator who became associated with us was John B. Oatman, who subsequently went to New Haven, and later to New York, where he became a member of the Stock Exchange. He died about five years ago. Another operator was Arthur Ingraham, who was stationed at Bridgeport. In the meantime the writer from the position of office boy had risen to that of operator. When the repeating station was removed to Springfield the duties of operator at Hartford devolved upon myself, working long hours, often extending far into the night, and

* James F. Gormley, of Boston, the author of this sketch, and who will likewise contribute several others in series, is a well-known former telegrapher, who has had an active and varied telegraphic career. His mind is richly stored with memories of the service, and of those who took an active part therein. What he has to say is of an interesting reminiscent character, and his utterances will be followed with attention, as they recall other days, other scenes and other names, long since passed into history.

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frequently being hard at it on Sundays. There was a certain esprit de corps exhibited in the telegraph service which appears to be lacking to a great extent in these latter years, for we were proud of the telegraph and to serve it was considered to be an honor—somehow it seemed to confer distinction on the individual.

At that time our company had but two offices in the entire state of Connecticut, one at Hartford, the other at New Haven. I recollect being called up one Sunday morning to know whether a message could be delivered at Litchfield, a town twenty odd miles to the westward of Hartford. In response to my offer to undertake the commission a message was shortly after received addressed to the Rev. John Pierpont, a noted divine, announcing the very serious illness of his wife. I personally acted as messenger, driving over and back across country in a buggy, the trip detaining me over night. It was an expensive telegram, but the charges were paid.

From Hartford I was transferred to Springfield, where I worked the New York circuit, changing tricks with Manager George B. Prescott. The American Telegraph Company having built a one-wire line to Troy, N. Y., and thence connecting with Albany, I was again shifted, this time to the former place. All business destined for the west taken by the American company was sent to Springfield, then on to Troy by the new line, where in turn it was repeated over the wires of the New York, Albany and Buffalo Telegraph Company. When the change was brought about removing the repeating office from Troy to Albany, the writer accompanied the transfer.

Shortly after this time the American company absorbed the Hughes printer, a system now so generally used on the European continent, and the invention of D. E. Hughes, of Kentucky. The House printing men readily adapted themselves to the Hughes system, quickly mastering its manipulation. It may be said that we also "took to" the combination invented by George M. Phelps, for his device embraced the good points of both the House and Hughes systems. By means of Mr. Phelps' invention we were enabled to work the full New York and Boston circuit without repeating.

A. A. Lovett, superintendent of the Commercial Telegraph Company, and who afterwards held a like position in the employ of the American Telegraph Company, constructed a line of telegraph connecting Pittsfield, on the line extending from Springfield to Troy and Albany. The building and operation of this short link was the cause, no doubt, that induced the Pope Brothers, of Great Barrington, Franklin L., Henry W. and Ralph W., to enter the telegraph service, for the advent of the electric wire into the precincts of their quiet home town engaged their attention and aroused their enthusiasm. I made the acquaintance of all three of these boys, and bright fellows they were. Frank, especially, used to come often to see me, and on such occasions would frequently spend most of his time in the yard of the New York Central railroad, inspecting its every detail, examining the engines and in sketching.

The American Telegraph Company had strung a single wire between New York and Philadelphia, which was to be operated by a Hughes printing instrument. I was invited to go to New York to take charge of this wire. Rufus B. Bullock,, who afterwards became governor of Georgia, and recently deceased, was stationed at the Philadelphia end. The New York office of the company was located at the corner of Hanover and Beaver streets, and William B. Clum, who died about a year ago, was the manager. At 21 Wall street was located the office of the New York and Washington House Printing Telegraph Company, which operated two wires to the national capital, with way offices at Trenton, N. J.; Philadelphia (Third and Chestnut streets), Wilmington, Del., and at Baltimore. J. C. Hinchman, whom I had previously known at Hartford was the manager of the New York office, and in his office was my old friend M. S. Roberts, together with a young fellow named Henry Bishop. The latter was going to England, there to work a Hughes instrument, and I was invited to accept the position thus to be made vacant. I was glad to do so, for I was brought in contact with those with whom I was well acquainted. There were a number of bright men, all congenial, acting together with a single harmony of purpose, connected with this line and stationed at its various offices. At Philadelphia, for instance, the staff embraced H. E. Thayer, manager; Robert Black, John Woodruff and George Snyder, operators. To this special coterie of telegraphers at the Quaker City I desire to add the name of James Merrihew, because he was a good fellow, and who at that time was manager of the Magnetic Telegraph Company. In Baltimore the force included such persons as Messrs. Filer and Mergenhard and John Lombard, while at the Washington terminal were to be found A. B. Talcott, Charles Noyes, Fred W. Royce and William F. Shiebler, the latter of whom recently died. Mr. Talcott, then as now, was familiarly addressed as "Pop," while Mrs. Talcott, whom everybody liked, was referred to as "Marm."

(To be continued.)

The throne has sanctioned the construction of a telegraph line into Lhassa, the capital of Tibet, and the residence of the supreme head of the Lamaist hierarchy. This innovation was recommended by the Chinese resident at Lhassa who, since the advent of the British expedition of 1904, has been working for the enlightenment of the Tibetans. The throne furthermore will give hospitals, schools and a mail service to Lhassa, and it is reported that a request has been made for permission to publish a newspaper there.

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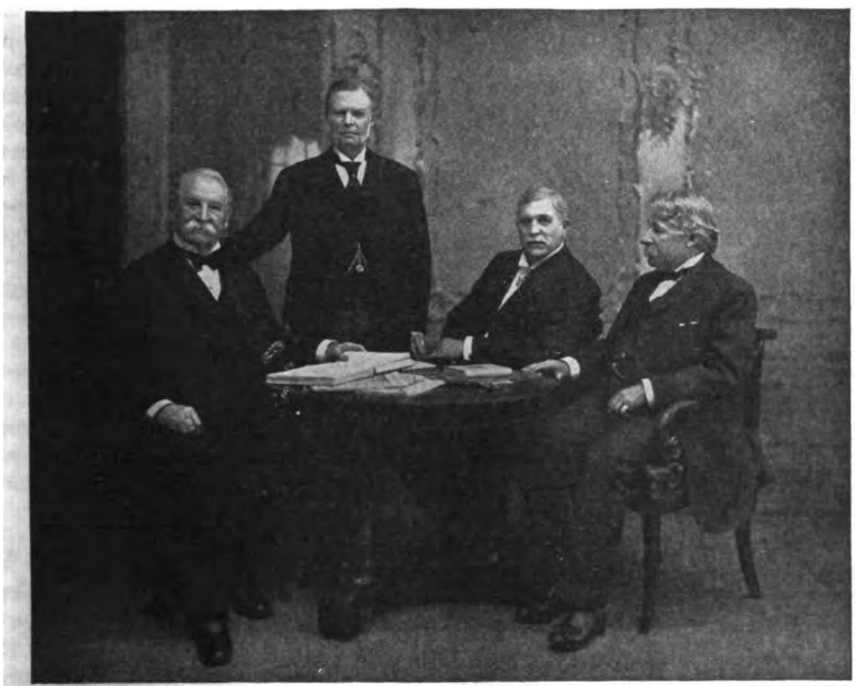
A Distinguished Group.

Members of the United States Military Telegraph Corps have always held a place high in honor and close to the heart of the telegraphic fraternity in this country. The original body of men who served their government at the key during the Civil War period, contributed peculiarly intelligent and brave service in its defence, differing in character, yet the peer of any that was rendered by the great army that went out to do battle for the country. The ranks of the body of telegraphers are now depleted and broken, but so long as any individuals remain to respond to the annual roll call they will be held in high esteem, and when at last all shall have passed over to the great majority, their names and fame will be held in loving memory.

A special interest attaches to the four who were virtually at the head of the organization during the war, all of whom are still living, hale and hearty, although the eldest, General Eckert, is nearing his eighty-sixth birthday. The engraving showing this distinguished group, herewith presented, will be received with interest, a welcome souvenir that will doubtless be preserved by many



THOMAS THOMPSON ECKERT.
Chief of the War Department Telegraph Staff, 1861-1866.

DAVID HOMER BATES.
Manager and Cipher-Operator, War Department Telegraph Office, 1861-1866.

CHARLES ALMERIN TINKER.
Cipher Operator, War Department Telegraph Office, 1861-1869.

ALBERT BROWN CHANDLER.
Cashier and Cipher-Operator, War Department Telegraph Office, 1863-1866.

Eliminating Disturbances on Telegraph Lines.

J. B. Taylor, of the General Electric Company, Schenectady, N. Y., who in conjunction with the electrical engineer's department of the Western Union Telegraph Company, New York, has been experimenting for some months past with the object of minimizing the effect of high tension currents on paralleling telegraph circuits, had a patent issued to him on December 10, 1907, which provides for neutralizing electromagnetic and electrostatic disturbances to telegraph circuits by single-phase railway lines. Energy is supplied from the high-tension conductors to the trolley circuit through step-down transformers. The trolley wire is arranged in sections, each section extending from one transformer station to another. The central point of the secondary of each sub-station transformer is connected to earth, and the outer terminals of the secondary winding are connected to the ends of the two sections ending at that sub-station. With this arrangement it will be seen that at the instant when one section is at a positive potential with respect to earth the adjacent section will be at an equal negative potential. Consequently if a low-voltage conductor extends parallel with and adjacent to the working conductor, the static inductions of the two sections on the conductor will neutralize each other. Since the currents in the two portions of each section of the working conductor supplying energy to a car neutralize each other, as far as magnetic induction upon the adjacent conductor is concerned, practically all inductive effects upon the conductor are avoided.

Bills for the purpose of establishing portfolios of telegraphs and telephones have been introduced in the legislature of the Province of Manitoba, Dominion of Canada.

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Report of the Erie and Michigan Telegraph Company for 1853.

BY NATHANIEL HUCKER, OF BUFFALO.

In looking over some old papers recently I found a copy of the annual report of James D. Haviland, superintendent of the Erie and Michigan Telegraph Company, giving the receipts and expenses of all offices of that system for the year ended December 31, 1853.

The force of the main office ("A" Buffalo) was as follows: Nathanial Hucker, manager, with the late James W. Hawn as operator, and two messengers. At the Dock office the late W. D. Allen was manager and E. D. Benedict, bookkeeper, and two messengers.

In the receipts of the "A" Buffalo office are included the tolls received from the two connecting lines, the New York, Albany and Buffalo Electric Magnetic Telegraph Company and the Buffalo and Canada Junction Telegraph Company.

In 1855 the following companies operated the Morse patents west of Buffalo: The Erie and Michigan, known as the Speed lines; the O'Reilly lines, and the New York and Mississippi Valley Printing Telegraph Company, using the House printing patents. The O'Reilly lines were taken over by the House system in 1855, and the Speed lines in 1856. Shortly after the absorption of these companies the present Western Union Telegraph Company was formed, when the late Ezra Cornell retired from active telegraph work. This consolidation of the various interests provided the foundation of the fortune of Mr. Cornell, the founder of the Cornell University, at Ithaca, N. Y., also the foundation of the fortunes of the late Hiram O. Sibley, of Rochester; J. H. Wade, of Cleveland, Ohio, and other well known pioneers of the telegraph systems of to-day, now controlled by the Western Union. Nathaniel Hucker was the first manager at Buffalo of the Western Union, who at the time of the consolidation filled the position as manager of the House companies.

According to Superintendent Haviland's report the Erie and Michigan telegraph system (Speed line) embraced the following points:

"A" Buffalo, main office; "DK" Buffalo, branch office; Dunkirk, N. Y.; Fredonia and Westfield, N. Y.; Erie and Girard, Pa.; Conneaut, Ashtabula, Painesville, Cleveland, Milan, Norwalk, Sandusky City, Fremont, Maumee, Toledo and Monroe, Ohio.; Detroit, main office, Detroit Dock, main office, Ypsilanti, Ann Arbor, Chelsea, Jackson, Albion, Marshall, Battle Creek, Kalamazoo and Niles, Mich.; South Bend, New Buffalo and Michigan City, Ind.; Chicago, Waukegan, Kenosha, Racine and Milwaukee, Wis.

The total receipts and expenses for 1853 taken from the superintendent's report, follow:

Receipts.

To cash on hand January 1, 1853	$3,013.00
Received for messages	69,305.49
Received for reports	3,389.66
Rent and for doing business of other lines	1,806.93
Total	$77,515.08

Expenses.

By paid other lines	$18,706.12
Salaries	26,766.23
Rent	2,829.09
Lights and fuel	764.09
Local repairs	2,479.35
General repair, rebuilding, etc.	8,770.67
Battery	953.42
Stationery	1,408.61
Postage	81.41
Furniture	331.39
Refunded	1,215.19
Miscellaneous	1,385.27
General Expenses	4,862.35
Cornell and Speed Lines	3,179.84
Taxes	187.24
Dividends	21.00
Amount on hand	3,573.81
Total	$77,515.08

Superintendent Haviland, in concluding his annual report, says: "The above statement shows an increase of $13,398.79 over the year 1852. During the past season the company has paid off the greater portion of its indebtedness, and at the close of the year has sufficient funds on hand and accounts due, which, when made available, will enable them to satisfy all outstanding claims.

"About 450 miles of old lines have been rebuilt during the past two years, and preparations made for rebuilding the remainder during the coming season.

"Under the head of general expenses is included payments made on the purchase of an opposition line between Chicago and Milwaukee and several large items of indebtedness of long standing.

"If the business of the company next season shows an increase equal to the past, there can be no doubt of securing a satisfactory dividend."

The Morse Electric Club.

The first annual meeting of the Morse Electric Club held since the organization was effected on April 25, 1907, occurred at 195 Broadway on the afternoon of Wednesday, January 8. The officers elected last year were again chosen. These are J. B. Van Every, president; J. C. Barclay and B. Brooks, vice-presidents; F. J. Scherrer, secretary, and R. J. Murphy, treasurer. Gardner Irving and M. H. Kerner, whose initial term as directors had expired, were re-elected for a period of three years. The directors constituting the remainder of the board are John A. Hill and P. J. Casey, whose terms will expire in 1909, and M. J. O'Leary and A. G. Saylor, who have each two years longer to serve. It was decided to hold a dinner on the evening of Saturday, February 29.

"Lightning Flashes and Electric Dashes," a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; price, $1.50, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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H. C. Worthen Becomes Night Chief Operator at New York.

Herbert C. Worthen, chief operator of the Western Union Telegraph Company at Buffalo, N. Y., has been transferred to New York and promoted to the position of night chief operator. This advancement places a member of the younger element in the service in a position of much responsibility, and is a deserved recognition of merit. Mr. Worthen was born at Shelby, N. C., July 22, 1877. Left an orphan at an early age,

HERBERT C. WORTHEN.
Night Chief Operator, Western Union Telegraph Company, New York.

he learned telegraphy at the Oxford, N. C., Masonic Orphan Asylum, of which institution he was an inmate, afterwards entering the telegraph service of the Seaboard Air Line Railway, December 5, 1890, at Clay, N. C. Here he remained, filling successively promotive places, until May 23, 1898, the last two years of his stay working as relief train despatcher. Subsequently he passed several months at Washington, D. C., with the Western Union Telegraph Company, but since August 8, 1898, was in the employ of that company in New York, with the exception of about a year passed with the Laffan Bureau of the New York Sun, and a few months in the train despatcher's office of the Atlantic Coast Line Railroad, at Richmond, Va. During the time he has been with the Western Union company he has been in charge of their interests at the Tribune office, and has held, respectively, the positions of traffic chief of the Southern and Eastern divisions and wire chief of the Southern switch and that of Southwestern wire chief, going to Buffalo to accept the position of chief operator in that city about a year ago. On his departure from Buffalo the force at that point presented Mr. Worthen with a handsome gold watch as a testimonial of their esteem. Mr. Worthen was elected vice-president of the New York Telegraphers' Aid Society in April, 1906.

Radio-Telegraphy.

A patent, No. 874,745, for telegraphy, has been granted to Patrick B. Delany, of South Orange, N. J. A system of wireless telegraphy.

A A. Allan and R. Bickerdike have been elected president and director, respectively, of the Marconi Wireless Telegraph Company of Canada. The elections were rendered necessary on account of the recent death of Lieut.-Col. Henshaw, president of the company.

John W. Griggs, former attorney-general of the United States and at present the attorney for Marconi, the inventor of one of the wireless systems of telegraphy, was heard in opposition to the Berlin treaty on January 8. The article of the treaty which provides that wireless messages shall be exchanged between ships and costal stations and between ships themselves, regardless of the particular system adopted by such ships and stations, is not regarded favorably by Marconi, as his attorney set forth.

Nevil Maskelyne, manager of the Anglo-American Telegraph Company, which controls the Poulsen wireless rights, is quoted in London papers as follows: "The new year will not only see the establishment of the Poulsen wireless telephonic service across the Atlantic, but also the establishment of the Poulsen wireless transatlantic service whereby photographs and sketches illustrating European news for American newspapers and photographs of criminals with such fidelity that they can be readily identified will be flashed across the Atlantic at the rate of one every five minutes."

The United Fruit Company has negotiated with the De Forest Wireless Telegraph Company for the establishment of stations at Belize, Puerto Barrios, Puerto Cortez, and Ceiba, Central America, probably extending the system as far south as Port Limon, Costa Rica. It is assured that wireless communication between these points and the United States will be in operation by the first week in February. The United Fruit Company will serve the public, but subject to censure of all messages, retaining the privilege of refusing for transmission such messages as may appear prejudicial to their business interests. The business men of Ceiba are much elated, and welcome the advent of the wireless as a factor of inestimable value to them in their commercial relations with the United States.

Letters From Our Agents.

PITTSBURG, WESTERN UNION.

We Pittsburgers point with pride at having one of the best-managed telegraph offices on the continent. How could it be otherwise, with Superintendent E. B. Saylor, Manager N. E. Church, Chief Operator W. J. Dodge, General Wire and Repeater Chief I. N. Barton and General Traffic Chief Sears, at the helm? The reputation of these gentlemen is too well-known to require further comment, as their names are synonymous with

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good discipline, kind treatment and skilful management in their respective positions. Mr. Barto has an experienced and capable assistant in W. H. Maize; and his staff at the board consists of Messrs. Cupp, Dagens and Larimore. The repeater department (largest in the Western Union system) contains nearly 100 sets of quadruplex, duplex, single, and Barclay printing repeaters, the latter being under the management of Dennis Kelly. The local Barclay printing department occupies a conspicuous position at the Fifth avenue end of the operating room, and is a marvel of neatness and convenience, having been installed by District Electrician George Kendricks. Three circuits are in successful operation at present—New York, Philadelphia and Buffalo; and others will be added as soon as instruments can be obtained from the manufacturers. Mr. P. Repsher has charge of this department, which is beginning to cut an important figure in matters telegraphic. After several weeks' experience with the block system, on one of the railroads entering Pittsburg, Robert Sterling is back at his former post in the repeater department, and everybody is glad to welcome him.

W. E. Price continues in charge of the Commercial News Department. Night Chief Operator Schiller has a pair of valuable assistants in traffic chiefs Rugg and Garrity, while Messrs. Armstrong and Wilson are required to show cause for delayed traffic in the way room days.

We are pleased to learn that Mrs. E. B. Saylor, wife of the superintendent, who has been seriously ill during the past several weeks with typhoid fever, is gradually regaining strength, and that there is no further cause for anxiety.

It was stated in the January 1 issue that G. M. Eitemiller was the wire chief in this office. This was an error, for Mr. Eitemiller left the service about four years ago, the position now being filled by I. N. Barto.

NEW YORK, WESTERN UNION.

Herbert C. Worthen of Buffalo, N. Y., has been transferred to this office as night chief operator, vice J. C. Robinson. A sketch of Mr. Worthen appears elsewhere in this issue.

Robert H. Morris, mechanical engineer, has returned to duty after a siege of sickness.

OTHER NEW YORK NEWS.

Assessment Nos. 472 and 473 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of Asa K. Burroughs, at Bedford, O.; Albert E. Grier, at Denver, Colo.; Jacob C. Houck, at Buffalo, N. Y.; Daniel A. Gibson, at Chicago, Ill.; Richard H. Woodward, at Long Branch, N. J.; Edward E. Cropper, at New York; Marshall A. McCord, at Laurel, Del.; Edward Sholes, at Oak Park, Ill., and John J. Deffley, at New York.

The Serial Building Loan and Savings Institution has declared a semi-annual dividend of two and one-half per cent. The directors of the association will meet at a dinner to be given at Shanley's on the evening of January 30. The Electric Building Loan and Savings Association has also declared a semi-annual dividend of two and one-half per cent. The directors of this association will meet at the dinner to be held jointly with the directors of the Serial Building Loan and Savings Institution.

The proceedings of the forty-first annual meeting of the Telegraphers' Mutual Benefit Association, which was held at New York, November 20, 1907, has made its appearance. Within its nearly thirty pages of well-arranged matter and of neat press work, the pamphlet embraces the report of President B. Brooks, of Secretary M. J. O'Leary, of Treasurer A. R. Brewer, the report of the auditing committee, together with a mass of carefully compiled statistical information. Altogether the presentation made shows the condition of this substantial old telegraphic organization to be in excellent shape.

A bank account and the possession of a home tend to make one independent, for they afford one a start in life, promote manly feeling and enthusiasm, and enlarge the outlook on life. If you are a telegrapher let the telegraphers' friend, The Serial Building Loan and Savings Institution, 195 Broadway, New York, do for you what it has done for others.

Old established, centrally located business in New York for sale, portion sublet as telegraph office more than paying rent and running expenses. Subway, surface and elevated roads pass door. Suitable for flowers, fruits, cigars or delicatessen. Excellent opportunity for telegrapher. Address "Opportunity," care Telegraph Age, New York.

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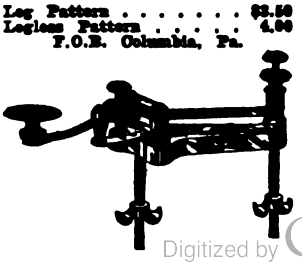

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Great North Western Telegraph Co. of Canada, Geo. D. Perry, purchasing agent, Toronto, Ont.

North American Telegraph Co., H. A. Tuttle, general manager and purchasing agent, Minneapolis, Minn.

Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

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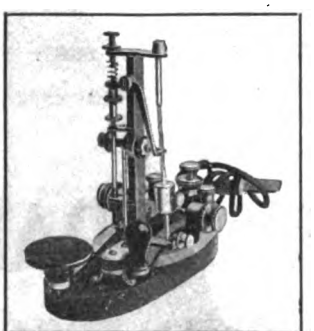

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The popularity of Phillips Code, by Walter P. Phillips, was never more apparent than at the present time. Its acceptance by the telegraphic fraternity, as a standard work of the kind, dates from its first publication, and the constantly increasing demand for this unique and thoroughly tested method of shorthand arranged for telegraphic purposes, has necessitated from time to time the issuance of several editions. The present edition was carefully gone over under the supervision of Mr. A. P. Velie, an expert press and code operator, for many years identified with The Associated Press, New York, a few revisions made and a number of contractions added, until now this "stanch friend of the telegrapher" is strictly up-to-date in every particular. It has been declared that an essential qualification of a "first-class operator" was a thorough understanding of Phillips Code.

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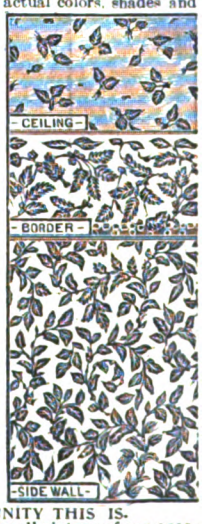

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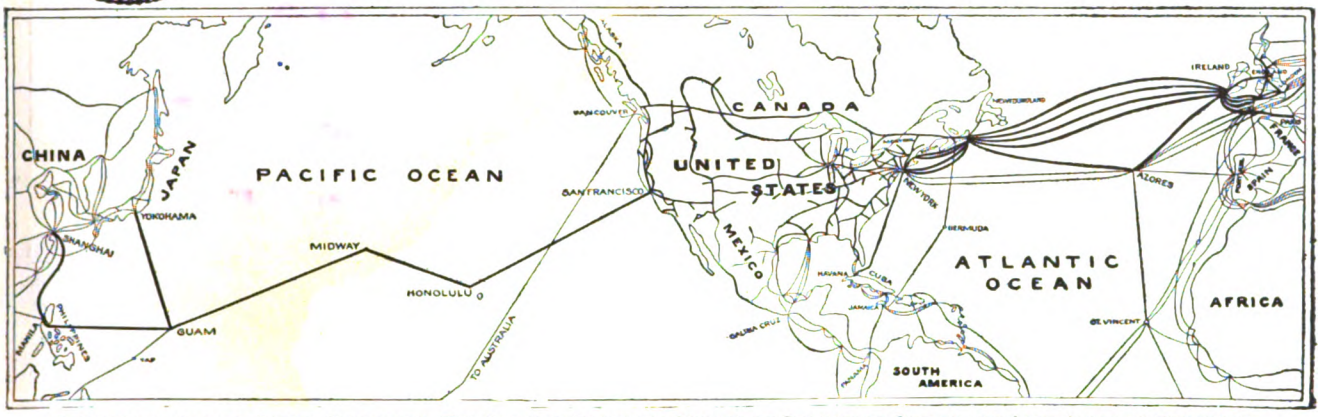

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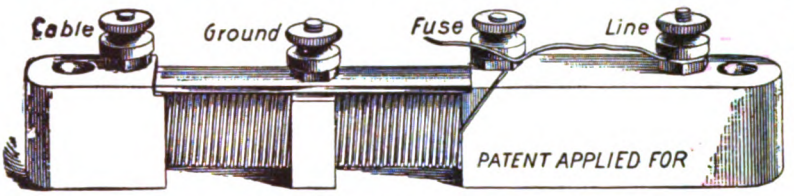

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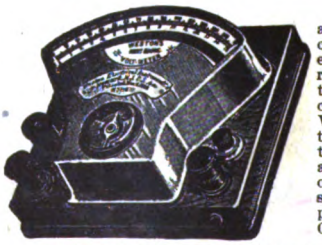

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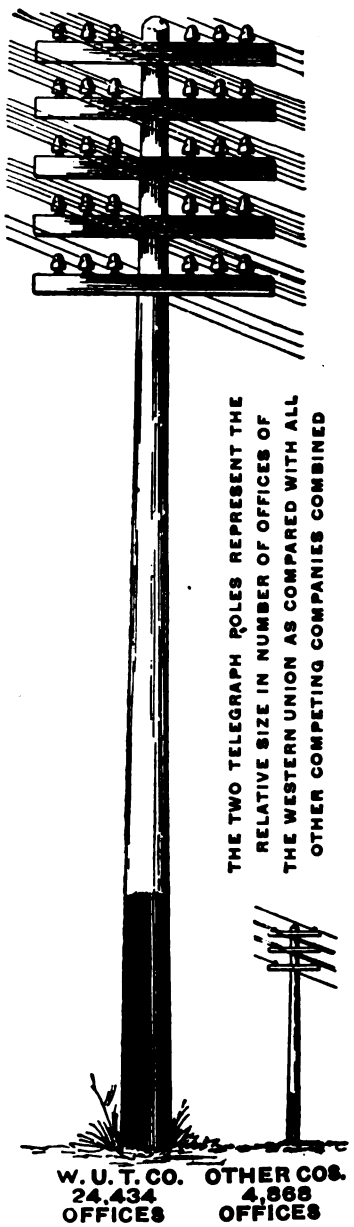

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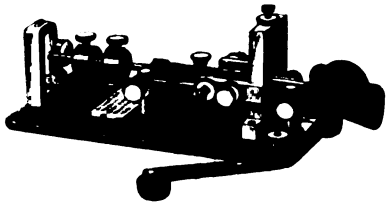

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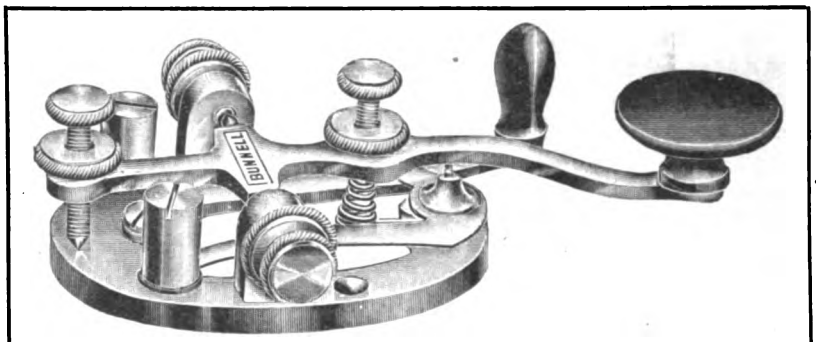

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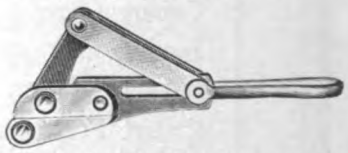

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Nearly every wire has its individual distinguishing mark, so to speak. That is to say, it "feels" somewhat different from its companions as indicated by the manner in which the wire chiefs test relay inserted therein is affected. Two companion wires may both be O. K. in every respect, yet each will "feel" differently from the other owing to different conditions existing in the two circuits. One wire may contain a great many relays, thereby creating a draggy action, the other but few, and thus causing a sharp, snappy effect.

In like manner other conditions may exist in certain conductors which contribute to give individual characteristics, hence the importance of becoming thoroughly familiar with the normal characteristics of each circuit. This knowledge would, of course, come eventually with experience, but it is so valuable that we suggest making an effort to early acquire the same.

For example, let us suppose that two companion way wires, No. 1 and No. 2, become grounded. No. 1 has a great many stations cut in and No. 2 but comparatively few. Naturally No. 1 will "feel" differently than No. 2 during normal conditions. In the first place it may possibly feel weaker because of less current, and will not work with the "snap" that No. 2 will on account of so many magnet coils being in the circuit.

Now, an inexperienced chief attempting to locate these grounds might conclude that No. 2 was grounded at a point this side of the ground on No. 1, merely because the current on No. 2 was so much stronger than that flowing in No. 1, whereas the facts may be directly opposite to this "indication." An experienced wire chief would not attempt to estimate the distance to the respective grounds by a comparison of the two values of current volume flowing in the circuits, but by the percentage of alteration from the normal flow noted in each wire separately; that is to say, by comparing roughly the strength of the current now flowing to the "ground," with that normally flowing in the same wire when the latter is O. K. Thus, if under normal conditions the current volume is, say, 40 milliamperes, and a "ground" on the circuit increases the current to eighty milliamperes, it follows that the "ground" is located at about the middle of the circuit, ohmically speaking. As the current volume increases inversely as the resistance of the circuit decreases we are thus able to make a pretty close guess as to the whereabouts of an accidental ground and thus lose but little time testing with unnecessary way stations. While an ammeter, of course, gives an accurate measurement of the current alterations, in practice the wire chief does not resort to that expedient except in difficult cases. He soon becomes able to estimate the value of the alterations by means of his relay with sufficient accuracy for ordinary purposes, and thereby saves a great deal of time.

In a similar manner the distance to an "open-

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ing" in a circuit is primarily estimated by a comparison of its existing and normal "static" conditions. Every wire possesses a certain capacity for holding a charge of electricity in captivity on its surface when the wire is open at its legitimate terminal. When the home or charging battery is removed and the wire quickly grounded in the board by the wire chief, the accumulated charge rushes back through his test relay to the ground and causes a static kick on his instrument in a degree proportioned to the amount of charge returning. It follows then that as the charge accumulated on a given conductor is in proportion to the total superficial area of the wire affected, other conditions being equal, the longer the wire the greater the kick. In other words, if the kick is very pronounced, look for the opening at a great distance, vice versa, near home. Here again the qualification must be noted that the comparison must be made with the known normal or full static capacity of the particular wire being tested. A comparatively short length of a railroad wire containing a great number of relays would give a greater kick than possibly twice that length of another wire containing few or no magnet coils. Hence it is the alterations we must gauge and not the size of the kick. The weather must also be considered in connection with both a ground and an opening test. However, these points are soon learned and a good wire chief is not often badly deceived by a mere rain storm. He simply makes a reasonable allowance for the temporary conditions and proceeds as under normal conditions.

LOCATING A CROSS.

When a wire is crossed with another circuit which carries a current of electricity the fact is usually determined by removing the home battery and grounding the wire reported at the switchboard and inserting the test relay in the spring-jack. Under these conditions the relay will show the presence of an incoming current from the as yet unknown wire with which it is crossed. To ascertain which wire it is crossed with the wire chief should open each wire in his board in turn for a moment, that runs along the same route until he finds one that when he removes the home battery therefrom also opens the grounded wire his test instrument is in. This will indicate that those two wires are crossed together somewhere on the line, the location of which is still unknown.

To determine the location of the cross the wire chief must ask the different way stations possessing the wire his test set is in to "open" the wire a moment. All stations this side of the cross will be able to open clear, but the first station beyond the cross cannot, because the current from the other circuit with which it is crossed will continue to flow back through the chief's test set to the "ground" in the switchboard whether the last tried station has his key open or closed. The lineman is then instructed that the cross will be found between stations, say, E and F, meaning between the most distant station that can open clear, and the first station beyond the cross who cannot.

When two circuits thus become crossed one of them must be thrown out of service in order to clear the other. This is done by opening one circuit each side of the point of contact. It is always best to open the wire as near the cross as possible, especially if it is a quadruplex circuit we wish to clear, for the reason that a long length of wire in contact with another circuit, even though it carries no current, adds a variable "static" to the wire it is in contact with through the charge it accumulates from the working circuit supposed to have been thus "cleared." By opening the discarded circuit at two points opposite but close to the cross the short length of wire then still in metallic contact becomes practically harmless. The other circuit may be made good by splicing between E and F with some other side or less important conductor, if such is available.

The presence of an incoming current, when the wire chief grounds at the board, must not in itself be taken as an indication of a cross. Here is where the chief must use his knowledge of the circuits individually. Some circuits have battery at each end of the wire, so he must not be deceived by what might prove to be a legitimate current. Others, such as city and short-way wires, work to a distant ground and, of course, could not show an arriving current unless crossed with another circuit.

Other indications of a cross are the inability to break a sending station, the arrival of the signals in a distorted or backstroke manner, and other peculiar manifestations one soon recognizes after a little practice. Hence, in the case of trouble on a wire with battery at the distant terminal it is upon the latter mentioned manifestations principally one must depend rather than on that of the mere presence of an arriving current such as would otherwise be sufficient evidence to disclose a cross on a circuit with a permanently grounded terminal. All these things must be considered at the time a test is made, hence the importance of knowing each circuit well.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 376,069, for a telegraph transmitter, has been awarded to Charles E. Lee, of Chicago, and Lewis K. Miller, of Brooklyn, N. Y. This telegraph transmitter has a toothed actuator movable into operative relation to a contact on its down-stroke and out of operative relation to the contact on its upstroke, and a key lever arranged to raise the actuator to permit its free return.

A patent, No. 876,312, for quadruplex or multiplex telegraphy, has been granted to Lawrence Connell, Jr., of Portland, Ore. The station apparatus comprises a polarized relay, a neutral relay having an armature and two main energizing coils, one composed of two differential high wind-

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ings and the other of two differential low windings, one of the high windings and the low winding of similar direction being connected in series in the main line and one coil of the polarized relay.

A patent, No. 876,391, for a telegraphic key, has been issued to Roy K. Patterson, of Chicago. Telegraph transmitting instrument having two keys, both of which move vertically as usual and one of which forms dashes and the other dots.

A patent, No. 876,669, for a telegraphic transmitter, has been taken out by D. S. Troth, of Fruitvale, Cal. A transmitting typewriter of the kind having a continuously revolving cylinder and key-operated detents for clutching different circuit-closing elements into action.

A patent, No. 876,886, for cable telegraphy, has been awarded to I. Kitsee, of Philadelphia. Means for relaying or translating true reversals impressed upon lines of comparatively large capacity.

Personal.

Mr. C. F. Annett, manager of the Western Union Telegraph Company at New Haven, Conn., was a visitor recently at Chicago, his former home, spending a few days in that city.

Mr. James Kent, of Montreal, Que., manager of the Canadian Pacific Railway's Telegraph, reached his fifty-fourth birthday on January 15. He was the recipient of many congratulations from hosts of friends, not only in the Dominion but also on this side of the border.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Morris K. Jesup, a director of this company, died on January 22. He was a man prominent in many affairs of the city, of fine culture, a philanthropist, and his passing has occasioned profound regret. He was in his seventy-eighth year.

Mrs. M. W. Hamblin, wife of the city superintendent, who has been seriously ill with typhoid-pneumonia, is reported to be convalescing.

Among the recent executive office visitors were Charles Selden, superintendent of telegraph, and F. G. Adams, circuit manager, of the Baltimore and Ohio Railroad Company, Baltimore, Md.

Mrs. Elizabeth Martin, mother of Mrs. C. H. Bristol, Mr. Bristol being the general superintendent of construction, died at the home of her daughter in Flatbush, Brooklyn, on January 11. The remains were taken to Chicago, her former home, for interment, Mr. and Mrs. Bristol accompanying the same.

Mr. W. W. Umsted, manager of the Omaha, Neb., office, accompanied by his wife, sailed for the south of Europe on the Republic on January 25. He will stop first at a number of Mediterranean ports, and will be absent seven or eight weeks. Many of Mr. and Mrs. Umsted's New York friends were at the pier to see the voyagers safely off.

The tariff book of this company for 1908 bears testimony to the genius of Mr. William Holmes, its author, as a compiler of versatile abilities. Such a volume, of course, is indispensable for reference purposes, and the careful and logical arrangements of its contents will make the vast fund of information it contains the more readily to be found.

RESIGNATIONS AND APPOINTMENTS.

Mr. E. T. Moore, manager at Knoxville, Tenn., has been appointed manager at Memphis, Tenn., vice W. A. McKeever, resigned.

Miss Nellie Beers, of Johnson City, Tenn., has been appointed manager at Morristown, Tenn., vice W. L. Sinclair, made manager at Baton Rouge, La.

Miss Laura C. Hull, of St. Louis, Mo., has been appointed manager at McComb, Miss., vice Mrs. A. M. Miller, appointed manager at Sheffield, Ala.

Miss C. M. Green has been appointed manager at Clarksville, Tenn., vice P. A. Williams, made manager at Cynthiana, Ky., in place of F. J. Timoney, resigned.

Mrs. M. M. Abernathy, of Jackson, Tenn., has been appointed manager at Decatur, Ala.

Miss M. E. Dunn, of St. Louis, Mo., has been appointed manager at Richmond, Ky.

Mr. J. Benedict has been appointed manager at Vicksburg, Miss., vice S. G. Bentley, made manager at Knoxville, Tenn.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Edward J. Nally, vice-president and general manager of the company, is at Atlantic City, N. J., where he is passing a short period seeking rest.

Mr. E. W. Collins, superintendent at Cleveland, who has been in the hospital for nine weeks, is recovering and expects to leave soon for Cambridge Springs, Pa., or possibly will go South.

RESIGNATIONS AND APPOINTMENTS.

The following changes have occurred in the service of the Postal Telegraph-Cable Company of Texas:

Mr. Joseph Coffer, manager at Muskogee, Okla., has been appointed manager at Oklahoma City, Okla., vice O. M. Lowe, made manager at Little Rock, Ark.

Mr. P. S. Coleman, an operator in the Dallas office, has been appointed manager at Muskogee, Okla., vice Joseph Coffer, transferred.

Mr. P. H. Fennell, manager at Monroe, La., has been appointed manager at McAlister, Okla., vice D. L. Edwards, made manager of the Hot Springs, Ark., office.

Mr. W. I. McFatter has been appointed manager at Pine Bluff, Ark.

Mr. W. E. Griffitts, manager of the Hot Springs, Ark., office, has been appointed manager at Fort Worth, Tex.

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The Cable.

Cable communication is interrupted January 28, with:

Venezuela — Jan. 12, 1906.
Hayti — Jan. 18, 1908.
All offices closed to international traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.
Demerara — Jan. 25, 1908.

Theophilus Smith, chief of the submarine cable laying department, of W. T. Henley & Co.'s cable works, North Woolwich, England, died suddenly on December 24, 1907. He assisted in the laying of the 1869 Atlantic cable. Following that his experience in submarine cable work was extensive and varied. Among the numerous cable-laying expeditions in which Mr. Smith took part, holding the leading position in those during the greatest portion of his career are the following: Havana-Key West; the French Atlantic cable on the steamship Great Eastern; British Indian cable; German-Norwegian cable; Aden-Zanzibar; Persian Gulf; Galveston-Vera Cruz; Cadiz-Teneriffe; Lima-Valparaiso; West Coast of Africa cables; the cables of the Cie. Francaise des Cables Telegraphique in the West Indies and along the coasts of Dutch and French Guiana and Brazil; a cable in Japanese waters, and, lastly, a line connecting Vancouver with the mainland.

Annual Dinner of the Commercial Cable Company Staff.

The seventh annual staff dinner of the Commercial Cable Company was held at the Hotel St. Denis, New York, on Saturday evening, January 18. The staff was well represented, all who could be spared from duty being present.

Mr. H. Vickers presided. The committee of arrangements consisted of Messrs. P. Keating, J. Dunlap, F. J. Mills, John Shea and J. Weyrich. A fine menu was served, after which an attractive programme of entertainment was gone through with. The first toast offered was "The President and King," by the chairman, drunk standing, the entire assemblage remaining on their feet while the orchestra played Hail Columbia and God Save the King. Vocal music followed, selections being rendered by W. O'Keefe and A. H. Roberts. Mr. Morgan Williams, in replying to the toast "The President and Executive," paid a glowing tribute to the officials of the Commercial Cable Company upon the great work they have performed in linking the continents with a Pacific cable and more recently connecting Cuba by a direct cable. This toast elicited hearty and prolonged cheers for the cable officials.

Mr. James Power then sang most acceptably two baritone solos and was followed by Mr. W. Sinnott, who rendered a number of Scotch, Irish and German dialect songs, besides reciting Scotch dialect stories, all of which were received with laughter and cheers.

The next toast, "Our Annual Dinner," was proposed by Mr. E. L. Cohn, who, by the way, is a member of the Old-Time Telegraphers' and Historical Association. His remarks were of a humorous character and were frequently interrupted with applause and laughter. He said that he objected to the title of the toast to which he was expected to respond, for in no sense was it his annual dinner. He reminded the company that he had his dinner every day in the year, and moreover he did not have to wait for it. Then he thought the staff would agree with him if he expressed the opinion that the present occasion was not their annual dinner. Respecting the gastronomic habits of the committee, however, the speaker seemed unwilling to commit himself. The speaker took exception to the oft-repeated remark heard with great regularity at these annual repasts that their "object was to promote good feeling, brotherly love and harmony among the members of the staff, and to bring them in closer relations with our officials," because the motive could not be any other than to excite attacks of indigestion in the human anatomy accustomed to daily menus of "beef and," or tea and toast. The "brotherly love" phrase might, he said, be all right, but he thought it found a more correct expression in enabling the diners to place themselves on view with a clean shave and dressed in their Sunday clothes.

He concluded by hoping that the annual dinner would become a permanent institution.

Mention should be made of the piano playing by L. S. Fisher, who accompanied all the singers except Mr. Sinnott.

During the progress of the dinner the orchestra played all the latest popular airs, in which the assemblage joined, and it was well past midnight when "Auld Lang Syne" was sung and the affair passed into history.

The Railroad.

C. S. Rhodes, of Indianapolis, superintendent of telegraph of the Big Four lines, has had the Lake Erie and Western telegraph lines added to his jurisdiction. Heretofore it has been under the Lake Shore supervision.

The New York, New Haven and Hartford Railroad Company has opened a school of telegraphy at the terminal station, Boston, and it is under the direction of former Chief Train Dispatcher Thomas F. Ryan. This school was opened for fitting young men for operators on account of the new law which becomes effective March 1 next, making shorter hours for railroad telegraphers, which will necessitate a larger number of these employees.

The Burlington system of railways has recently adopted a telephone system of train despatching between Aurora and Mendota, Ill., a distance of forty-six miles. Business is heavier in this section than anywhere else on the Burlington division and there has been considerable difficulty in handling the trains as quickly as desired, but with

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the telephone system the danger of all misunderstandings between the train despatcher and operator has been minimized, says the Telephone Journal, and a much clearer understanding is to be had telephonically than has been possible telegraphically, with a corresponding decrease in the liability of accidents. This idea in relation to the despatching on the Burlington system has been original with F. C. Runnells, the chief train despatcher at Aurora, and is the first experiment of the kind that has been attempted on that system.

RAILWAY SIGNAL ASSOCIATION.

The regular meeting of this association was held at the United Engineering Societies Building, New York City, on January 14, President A. H. Rudd in the chair.

The first discussion was that on specifications for the installation of automatic block signals, taking up the report which was presented at the Milwaukee meeting last October, but which was not then discussed.

In the afternoon the association listened to a paper by T. R. Cook, an electrical expert of the Pennsylvania lines west of Pittsburg, on "Economy in the Use of Storage Batteries in Operating Signals and on the Details of Caring for Such Batteries." Statistics of service and of experiment were presented, showing the cost of operating signal motors by power derived from a power house conveyed by a line wire, and by primary batteries situated at the signals; and the principal conclusion was that for the average double-track road the cost by the power line will be thirty per cent. less than with the use of gravity batteries.

In the discussion Mr. W. H. Elliott thought that Mr. Cook had figured the cost of using gravity cells too high, and that the saving by using the power line would be greater than he had shown. Besides this there is a marked advantage in using a power line, with storage batteries, because of the greater freedom from failures.—The Railroad Gazette.

Obituary.

William M. Mallett, of Sharon Springs, N. Y., formerly manager of the office of the Western Union Telegraph Company, at Syracuse, N. Y., from 1880 to 1884, died of cancer in New York on January 12.

C. W. McReynolds, aged sixty-five years, an old time telegrapher and a member of the Society of the United States Military Telegraph Corps, while in a despondent mood recently shot and killed himself at his home in Denver, Colo.

Richard Fischer-Treuenfeld, engineer and Paraguayan consul-general, died at Dresden, Germany, December 29, 1907, aged seventy-three years. The deceased was an authority on military telegraphs, and at one time was major-commanding the Paraguayan military telegraph corps. For many years he was associated with Messrs. Siemens Brothers. A short time ago he published an interesting article entitled "Twenty-five Years' Progress of Military Telegraphy."

Frank Hughes, aged forty-five years, for many years an employee of the Western Union Telegraph Company, and formerly manager of the Houston, Tex., office, which he relinquished in 1906 on account of impaired health, died in that city on January 11.

Job Anderson Munson, aged sixty-six years, manager of the Western Union office at Herrs' Island stockyards, Pittsburg, for the past thirty-five years, and a well known operator in Western Pennsylvania, died in that city January 14. He served in the United States Military Telegraph Corps throughout the Civil War. He was a member of Duquesne Commandery, K. T., Syria Temple of Shriners, Hailman Lodge No. 321, F. and A. M., Pittsburg Consistory, and the Friendship Avenue Presbyterian Church.

Robin D. Weeks, aged thirty-one years, wire chief of the Western Union Telegraph Company at San Francisco, Cal., died in that city on January 19 from blood poisoning, the result of a puncture by a rosebush thorn. Mr. Weeks has been in the employ of the Western Union company for a number of years, working his way up from the key to traffic chief, wire chief, and rumor had it that another promotion was in sight had he not been taken away. He leaves a wife and a daughter, four years old, besides many friends to mourn his loss. He was the agent at San Francisco for Telegraph Age and was held in high regard by its publisher.

George F. Randolph, a member of the operating staff of the Postal Telegraph-Cable Company, New York, died of pneumonia at his home in Brooklyn, on January 15. He was born at Plainfield, N. J., October 13, 1858, and entered the telegraph service at that point as a night operator. In 1878 young Randolph was placed in charge of a branch office of the Western Union Telegraph Company at Harlem, New York City, afterward entering the service of the American Rapid Telegraph Company. Later he became manager of Western Union interests at Asbury Park, N. J., subsequently entering the employ of the Baltimore and Ohio Telegraph Company at New York. When this company was absorbed by the Western Union Mr. Randolph opened the office of the New Jersey Electrical Company, at Newark. Returning to New York, he entered the service of the Postal company, in which local employ he had since remained, except for a year or more spent at Denver, Colo., in the same interests. Funeral services were held in Brooklyn, Saturday evening, January 18, the burial being at Plainfield, N. J.

Those who contemplate subscribing for TELEGRAPH AGE, and who would first like to inspect a sample copy, should not fail to write for the same.

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Superintendent Jesse Hargrave, of the Postal Telegraph-Cable Company, as an Author.

Jesse Hargrave, until lately assistant electrical engineer of the Postal Telegraph-Cable Company, New York, and now one of its superintendents, recently essayed the role of author with distinct success. To the new and revised edition of "Electrical Instruments and Testing," by Norman H. Schneider, just out, which treats of the use of the voltmeter, ammeter, galvanometer, potentiometer, ohmmeter, the Wheatstone bridge and the standard portable testing sets, Mr. Hargrave has contributed important matter which appears in the two concluding chapters, one treating on testing telegraph wires and cables, the other in locating faults in telegraph and telephone wires and cables, in which valuable tables are given. This matter in detail may be summed up under the following heads: Early morning tests; wrecks; locating grounds by Wheatstone bridge measurements; measurement for crosses using Varley test; measurement for crosses using the two cross wires only; locating a cross by voltmeter test; insulation tests by milliammeter method; insulation tests by voltmeter method; conductivity tests; location of grounds and crosses by Varley method using multiplied arm ratios; how to find trouble after located; Varley test; Murray test; locating openings in cable conductors by bridge method; resistance measurement; fault location; to locate openings using buzzer and telephone. Mr. Hargrave's treatment of his subject has been especially well considered and embodies the best thought of this well-known telegraph authority who has devoted all the years of his business life to the telegraph service. Mr. Hargrave's experience in the class of tests he describes, respecting which telegraph people desire specific information, well qualifies him to prepare the descriptive matter he has so carefully done in this volume. There is, in fact, no other book that treats so comprehensively and with so much elaboration of detail the subjects he discusses. Mr. Hargrave's knowledge of the requirements necessary to fit a man for responsible service in telegraph employ has prompted him to furnish all necessary information to meet any probable emergency that is likely to arise in wire and cable testing.

The volume embraces 256 pages, has 133 illustrations and diagrams. Price, cloth, $1; in full limp leather, $2. Address all orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Electrical Engineer Canadian Pacific Railway's Telegraph Names Telegraphers Who Have Risen to High Official Position in That System.

Editor TELEGRAPH AGE:

In the issue of Telegraph Age for January 16 appears an item naming several officials of the Chesapeake and Ohio Railroad Company who started life as telegraph operators. The official lists of many other railroads will show similar advances from the key to the occupancy of high positions. Here is a list of them on the Canadian Pacific Railway: Sir William C. Van Horne, chairman of the board of directors; Charles R. Hosmer, director, and J. W. Leonard, assistant general manager.

The record also includes all of the general superintendents of the system, as follows: William Downie, Atlantic division; H. P. Timmerman, Eastern division; F. P. Brady, Lake Superior division; R. R. Jamieson, Central division; A. Price, Western division, and R. Marpole, Pacific division. The latter, I understand, was an operator in Great Britain.

Of the thirty-four superintendents and assistant superintendents, sixteen were operators, as follows: D. W. Newcombe, St. John, N. B.; T. Williams, Farnham, Que.; H. B. Spencer, Ottawa, Ont.; R. McCormick, Montreal, Que.; C. Murphy, London, Ont.; A. L. Smith, Toronto, Ont.; G. Spencer and J. H. Hughes, North Bay, Ont.; W. B. Way, White River, Ont.; J. G. Taylor, Fort William, Ont.; A. E. Stevens, Winnipeg, Man.; G. E. Graham, Souris, Man.; J. S. Lawrence, Medicine Hat, Alta.; E. L. Chudleigh, Strathcona, Alta.; J. T. Arundel and J. Goodfellow, Vancouver, B. C.

The other eighteen graduated from the engineering staff—trainmen, stenographers, etc. A fine register, is it not?

W. J. CAMP.

Montreal, January 23, 1907.

One Letter Caused Bad Error.

The New York Times apologized in its issue of January 21 for an inadvertent statement due to a peculiar telegraph error, appearing in its columns some time ago. It appears that that journal printed an article relating to the estate of John H. Sutphen, ex-County Clerk of Queens County, N. Y., unintentionally reflecting upon Howard and Harry Sutphen, of Jamaica, L. I.

The Times says: "The article, which was filed in a telegraph office at Jamaica, quoted the estate's lawyer as saying that he held in his possession for the widow 'numerous unpaid notes.' A great many of these notes, the printed article went on, 'were given by her sons now living in Manhattan and Queens Borough.'

"The regular correspondent of The Times filed a despatch at the Jamaica telegraph office, which said that a great many of these notes 'were given by persons now living in Manhattan and Queens Boroughs.' In the telegraph code four dots stand for h, and five dots stand for p. Through a mistake in sending or a mistake in receiving this message the 'p' was changed to 'h,' thus transforming 'persons' into 'her sons.'"

Orders for books on telegraphy, wireless telegraphy, telephony, all electrical subjects, and for cable codes, will be filled by TELEGRAPH AGE on the day of receipt.

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Censorship of News from the Battleships.

The rules that guide the newspaper correspondents who embarked with the Pacific fleet of war vessels are thus laid down in a letter to them from Admiral Evans:

"While the commander-in-chief is glad to welcome you to the fleet, he is obliged, in the interests of the government, to impose certain restrictions upon you during the time you are on board ship.

"These restrictions are that you will bind yourself:

"(a) To submit all matter that you may desire to send to your press associations to Commander Chandler, U. S. N., and not send out anything which he thinks should not be sent.

"(b) To refrain from giving out for publication either while still with the fleet or later any information that might be of value to a possible enemy, such as detailed descriptions of mechanisms or of methods of drill, method of handling fire control, tactical maneuvers, score at target practice, etc.

"(c) To conform to all regulations and customs of the service in so far as they may apply to your life aboard ship and your associations with the officers and men of the navy.

"(d) To send nothing of any kind to any other destination than the press association you represent, with the understanding that all such matter is to be equally available for all members of such association. This will be construed to forbid you mailing or sending any special matter to any newspaper, periodical or magazine so long as you remain with the fleet.

"The commander-in-chief relies upon your patriotism to insure that no information of value to an enemy in time of war shall be allowed to become public as a result of your presence on board ship."

What Is a Bond?

The "Wall Street Summary" in answering this question says:

"What is a bond? The simplest way to answer this direct and elementary question is, perhaps, to show the difference between a share of stock, a bond and a mortgage. The owner of a home worth, say, $2,000 wishes to borrow $1,000 and requests a savings bank to loan the amount on the home. The money is advanced by the bank and an instrument styled a mortgage is executed by the owner (mortgagor) and given to the bank (mortgagee) as collateral for the money advanced. In case of default in the interest payments this mortgage may be foreclosed at sheriff's sale, and the property sold to satisfy the original debt, interest and costs. A real estate mortgage is, therefore, a debt secured by real estate. Suppose, however, a railway company owning 10,000 miles of road, terminals and equipment wishes to borrow $100,000,000. The operation is obviously not so simple as borrowing $1,000 on a little homestead. An individual or institution willing to make a permanent loan of $100,000,000 is hard to find. The company, therefore, mortgages its property for $100,000,000, but divides this loan into pieces, denominations or units of say $1,000 each. These denominations or slices of the corporation's large debt are called bonds. Bonds are, therefore, debts of the issuing corporation secured by a mortgage on the company's property.

"A stock, however, does not represent a debt, but is a certificate showing that the owner is a partner in the enterprise. A stockholder participates in the profits and shares the losses. Bonds, whether secured on real estate, mines, factories, railroads or other assets are debts, the principal and interest of which must be paid when due. Stocks, however, are equities and receive no returns unless profits are distributed in the form of dividends."

Business Notice.

The Weston Electrical Instrument Company announces that they are offering two new patterns of goods, for use as ammeters and voltmeters on direct current switchboards, under the distinguishing name of "Eclipse." They are of the "soft-iron" or "electro-magnetic" type. In presenting these instruments the company states: "In the accuracy of their indications under all the widely varying conditions of practical use, they very closely approach the Weston permanent magnet switchboard instruments, but, of course, these Eclipse instruments do not have evenly divided scales. The scale divisions are, however, excellent for soft-iron instruments. They necessarily take more power to operate them than do the Weston permanent magnet instruments; but they nevertheless require very little power. In sensitiveness, or power to promptly respond to minute changes in potential difference, or to minute changes in current strength, they also closely approach the Weston permanent magnet instruments. In their dead-beat qualities they also closely approach the Weston permanent magnet type of instrument."

These instruments afford another addition to the high grade goods manufactured by this company

Magnetic Oscillators as Radiators in Wireless Telegraphy.

Oscillators of the open or Hertzian type are usually called electric oscillators since the effects produced in the external field are to a large extent determined by the potentials of the free electric charges which alternately make their appearance at the open ends. If, however, the oscillator consists of a metallic circuit completed by a condenser, the plates of which are very near together, the effects on the external circuit are mostly or largely determined by the current in the circuit, and little, if at all, by the condenser-plate charges, because these, being of opposite sign and near together, neutralize each other's effects in the field. Such a closed, or nearly closed, circuit is called a magnetic oscillator.

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Orrin S. Wood, Sender of the First Newspaper Dispatch from Washington.

Few men are better equipped with facts relating to the telegraph and to the personnel of newspaper life as it has existed at Washington during the last fifty years and more, than William H. Young, night chief operator at the capital of the Western Union Telegraph Company. A frequent contributor to the press, he is generally pretty sure of the statements he makes for publication, yet Orrin S. Wood, the veteran telegrapher, who reached his ninetieth year on December 14 last, and who consequently possesses a memory based on personal experience antedating other telegraphic authorities, points out an error in Mr. Young's very interesting article appearing in the January 16 issue of Telegraph Age. Mr. Wood says:

"In the article, 'Old Newspaper Row,' Mr. Young, one of our old-time telegraphers, states that the first dispatch by wire from Washington to a newspaper was sent in 1853 by William B. Shaw, to the New York Herald. This is an error of nine years, for in 1844 I sent most of the news received at Washington of President Polk's election to the Baltimore American; and through the following winter I sent reports of the proceedings of Congress to the same paper during the session of 1844 and 1845, for which, I may add, nothing was paid for transmitting. On the fifth of March, 1845, I left Washington to meet the late Hon. Ezra Cornell in New York to arrange for building a telegraph line between New York and Philadelphia."

To Show Time of Filing and Receipt of Telegraph Messages.

The state railroad commission of Georgia on January 10 passed an order requiring that the exact time of filing and receipt in the delivery office shall be shown on all telegrams delivered in that state. While the order does not so specifically state, it is understood its application will be only to telegrams between Georgia points. It is not expected that any effort will be made to make it cover interstate business. The order will go into effect after due notice has been given by publication of the commission's circular. It is not stated whether or not the telegraph companies will obey the order.

The Telegraph in Hungary.

At the end of 1905 the telegraph system in Hungary comprised 23,718 kilometers of line, and 128,315 kilometers of wire; 82,785 of the latter were the property of the state, and 42,245 belonged to railways, while two hundred and seventy-four were owned by private undertakings. The system represents an increase over 1904 of 282 kilometers of line and 4,181 of wire. Two new circuits were opened, one between Budapest and Berlin, and the other between Budapest and Bukarest. The number of offices increased by one hundred and six, from 3,707 in 1904 to 3,813 in 1905, there being one office for every 5,049 inhabitants; 1,871 were owned by the state, 1,918 by railways, and twenty-four by private undertakings. Inland traffic showed an increase of 220,184 telegrams over the previous year, the total number being 5,927,643, as against 5,707,459. International traffic claimed 3,073,369 telegrams, of which 1,602,171 were dispatched, and 1,471,198 received. There were also 532,850 telegrams in transit, making a grand total of 9,533,862 telegrams, or an increase over the previous year of 418,642 telegrams. Increases occurred in all classes of traffic mentioned.

The Telegraph in China.

At the end of 1906 the imperial Chinese telegraph administration had a system of 22,419 miles, with 34,473 miles of wire and 946 nautical miles of submarine cable. There were 379 offices, of which sixty-two were open day and night, the others during the day only. The number of instruments in actual use was 768. The general operating staff consisted of 3,175 men, while the inspectors and linemen amounted to about 2,400. In addition to this equipment there are many special provincial lines usually constructed by the administration, but worked and managed independently by the provincial authorities. A number of foreign companies have connections with China. There is a French cable at Amoy; a German cable from Shanghai to Kiaochow and Chefoo, and a third cable, partly Chinese, from Chefoo to Port Arthur. The last was cut during the war between Russia and Japan, and is not yet repaired. China also has telegraphic connection with Burma, Indo-China, and Russian Siberia.

War Department Telegraph Staff.

Mr. David Homer Bates, of New York, writes: "I take pleasure in sending you a framed picture of the Civil War department telegraph staff, taken May 31, 1907, which I told you sometime ago was being finished for your sanctum sanctorum."

This picture is a finely executed photograph and bears the tablet giving the names of General Thomas Thompson Eckert, chief; David Homer Bates, manager and cipher operator; Charles Almerin Tinker, cipher operator, and Albert Brown Chandler, cashier and chief operator.

Representative E. W. Saunders, of Virginia, offered a resolution in the House of Representatives on January 22 for the appointment of a committee "to investigate the Western Union and Postal telegraph companies in their relations toward the American people as public utility corporations."

The former president of the American Telephone and Telegraph Company, Frederick P. Fish, tells a Boston audience that "competition, the life of trade in the old days, is almost the ruin of trade under conditions existing to-day."

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Important Subjects Treated in Back Numbers.

TELEGRAPH AGE has published the best articles on telegraphic subjects that have ever appeared in print. Herewith are enumerated a few of the most important subjects treated, together with the date of the papers containing the same. Copies of these back numbers may be had at twenty-five cents apiece upon application. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

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Alternating Current Transformer for Quadruplex, W. H. Jones .....Mch. 1-16, 1904
American Cable Across the Pacific .....July 16, 1903
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Wire, Hard Drawn Copper, History of, Thos. B. Doolittle, ...Jan. 1-16, 1906
Wheatstone Bridge, F. W. Jones .....Nov. 16, 1906
Wright Keyboard Transmitter and Printer, R. Hitchcock..Apl. 1, 1906

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26, 1908.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Railway Signal Association will meet in 1908 at a date and place to be named later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., in 1908, at a date to be named later.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers' Association meets at Fort Worth, Tex., on June 18, 1908.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

The influx of new men in the telegraph service has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is $1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

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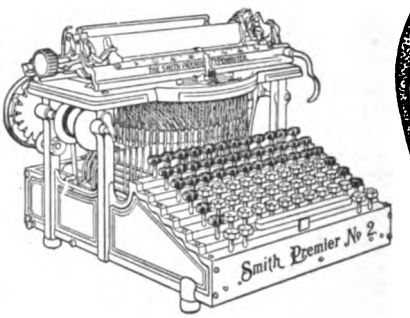

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NEW YORK, FEBRUARY 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Corporate Management.

The pendulum of so-called "reform" has swung so far in the direction of legislative interference with corporate management as to clog the wheels of industry and work injury in the body politic, rather than to confer any compensating means of relief. The disastrous results of much mischievous meddling are unfortunately everywhere apparent. For, not only is legitimate enterprise being checked and operation curtailed, but such unwise interposition as we are witnessing and have experienced at the hands of individual state law-making bodies in placing hindrances and stumbling blocks in the way of railroad corporations, for example, is destroying confidence, the single warrant guaranteeing stability and security in all human affairs. The invective so frequently uttered against corporations, whether railroad, telegraphic or otherwise, with which we are becoming too familiar, is both wrong and uncalled for, and as a rule is the expression of timid, or uninformed or demagogic minds. Because venality has been uncovered in certain fields of corporate business management—and where discovered should be sternly punished—it does not necessarily follow that all management coming under this head is bad. It is monstrous to force the implication as is being done by frequent legislative enactment, that men directing the affairs of corporations are unworthy of trust, for it is not true. Most of them who occupy such positions have reached these high offices because of long and careful training, the gift of capacity and business acumen fitting them to control and direct the vast responsibilities with which they are charged. Such men are not vendible; they are possessed with sterling integrity, and few there are who are qualified to rank as their equals in the world of finance and in the exercise of executive skill.

Corporations in this country—call them trusts if you please, for that is but another name for the united and contributory efforts of men engaged in promoting a common cause, are here to stay. We do not need to be told that in minor form they have long had previous existence. Their further extension is a natural development, conferring still greater benefits, civilizing in influences, for without them but slow progress would be made in the evolution of the world and the advancement of the race. In a word, the combination of many secures results denied to the few or to the individual. But these questions, important as they are, are academic, and should hold intelligent acceptance in the minds of all men. We would, however, in view of much that is current in speech and action to-day impose their further study and careful consideration upon all receptive understandings. For the frequent bitterness with which corporations, as such, are assailed, presents a feature of reactionary thought and purpose, alarming in its power to work injury—a bitterness that is without warrant inasmuch as it is calculated to strike venomously at the root of important business interests and undo much that has been accomplished for good. This feeling is further reflected and intensified in the manifestation of unstatesmanlike qualities governing legislative intellect and deed in dealing with this all-important and fundamental situation.

In the telegraphic field the incessant annoyance that the companies are subjected to by the imposition of municipal, county, state and national ordinances seeking to establish degrees of control and methods of unjustifiable taxation, are of a character with present-day manifestations of interference directed against corporations. It becomes a question, indeed, whether such obstructions placed in the way of the telegraph are not actuated more by motives of greed rather than directed by those of an honorable and disinterested public spirit. It would appear sometimes to the amazed observer to be a question of "stand and deliver"—the obnoxious corporations must be bled!

And yet it should be remembered in the case of the telegraph, as in that of the railroads and

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all other corporations as well, that the stock of these incorporated companies is widely distributed, held in the hands of thousands, frequently by widows and orphans, to many of whom it affords the sole source of income. To strike at the companies by adverse legislation is to strike at individual welfare and thereby cause much suffering on the part of innocent persons. It should be the duty of the state to sustain and not pull down or impair the strength of incorporated industries. This would be the exercise of a high-minded form of patriotism.

No solution of existing questions affecting the public mind relative to the betterment of corporate management can be arrived at by any form of governmental ownership, for which we hear an occasional wild and ill-considered demand. What is already bad in management would become worse by the change, and stagnation, which means dry rot, would finish the rest. Fortunately the intelligent and practical thought of the country is not socialistic, and is adverse to any such procedure as government ownership as a means of settling alleged business ills. It is safe to say that public utilities will never become governmental appendages in these United States. Moreover, the attitude of the Congress is that of adamant against any such proposition.

Sir Wilfred Laurier, the Dominion Premier, pointed out in his exceedingly lucid and sane speech on kindred subjects recently brought before the Canadian Parliament that "It was undeniable that corporations had sometimes acted mischievously, but it was also true that corporations had been one of the most potent agents of the creation and distribution of wealth among all classes of the community. It was undeniable that corporate capital, corporate labor and corporate effort would do more than individual capital, labor or effort."

Sir Wilfred also remarked that the man who looked upon the question calmly and dispassionately must come to the conclusion that the interests which were served to-day by private enterprise were better discharged than they could be by the state. The question was as to a remedy, and he apprehended that the remedy was not to entrust the railways to the state. The true policy was to have the corporations subjected to the control of Parliament, which would see they discharged their duties properly.

The question of jurisdiction in this country is one of the highest importance concerning which the government may in the future be called upon to take action. There will be no public ownership, but if within the limits of control or regulation, particularly of interstate carriers, should the subject be taken up, it must be approached only on the broadest plane of philanthropy.

Anti-Futures Bill

The Anti-Futures Bill before Congress makes it unlawful to send or receive a message by telegraph or telephone line relating to foreign or interstate contract for future delivery of grain without intention to actually deliver the grain or both parties being obligated to the delivery of the grain. The violation entails the penalty of $500 to $1,000 for each case.

Section 2 makes it the duty of any party sending or receiving a message relating to a contract for future delivery of grain to furnish upon demand an affidavit to the other party that he is the owner, producer, or is legally entitled to the future possession of said grain by virtue of a contract for its future delivery, made by the owner thereof, also giving the name of the other party to the contract and the time and place where the contract was made, and the price, and has the bona-fide intention to deliver or receive respectively the grain so contracted. The failure to make such requested affidavit shall, in an indictment, be prima facie evidence that the message sent related to a contract without intention to deliver or receive the grain.

Section 3 makes it unlawful for telegraph or telephone companies knowingly to receive from or transmit to another state, territory or foreign country, any message relating to such prohibited contracts, under penalty of fine from $500 to $1,000 for each such message.

Section 4 makes it unlawful for telegraph or telephone companies knowingly to allow the transmission of messages relating to such forbidden contracts from one state or territory to another or to or from a foreign country if presented by a person in a commission or brokerage business or by a produce association unless such party shall have filed with such telegraph or telephone company an affidavit that the message does not and all such messages for the next six months will not relate to the contracts described.

Section 5 forbids any letter or publication containing a record or notice of transaction of an exchange wherein such contracts are described to be carried in the mails or delivered by any mail carrier and makes the party depositing such unmailable matter liable to penalty of $1,000 to $5,000 or imprisonment from one to five years or both.

Section 6 provides for the return of such unmailable matter to the post office from which it was sent.

The framers of this bill, unwittingly, perhaps, would, in the event of its becoming law, confer enlarged scope and power to the telegraph companies, inasmuch as it would give their conductors inquisitorial rights. The logical workings of such a law would be to subject customers to a system of scrutiny and close questioning, and all such would be required to furnish affidavits on demand. Telegrams could not, therefore, be received from clerks or messenger boys, principles only in all cases would be obliged to appear. Telegrams in cipher would necessarily be barred from the wires unless employees concerned in their handling were familiar with the code used. It is hardly likely that legislation of this character will ever be enacted into law.

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Address of George Gray Ward at Memorial Services in Honor of Lord Kelvin.

In our issue of January 16 reference was made to the remarks of George Gray Ward at the memorial services held Sunday, January 12, in honor of the late Lord Kelvin. Mr. Ward dwelt at length on what Lord Kelvin had accomplished in his long and distinguished career to make submarine telegraphy the success that it is. Mr. Ward said:

Fifty years ago the world was waiting with profound interest the outcome of that gigantic enterprise which eventually culminated in the completion of the short-lived but all important first transatlantic cable of 1858. Two ships were required to carry and lay the cable, namely, the United States frigate "Niagara" and H. M. S. "Agamemnon." Lord Kelvin, then known as Professor Thompson, was the electrical engineer in charge on board the Agamemnon," and now just as the jubilee of that historic and epoch-making event approaches, we pay homage to his memory as the man whose contributions to the success of submarine telegraphy cannot be overrated, the man who, we may truthfully say without the slightest exaggeration, first made long ocean telegraphy possible.

As early as 1855 he outlined the laws of the speed of signals through ocean cables, and their connection with other natural forces. In 1856 he knew, what no one else seemed to suspect, that two or more insulated wires of any great length under one sheathing would suffer so much from natural induction as to be unworkable and he warned engineers of the danger of constructing such a cable.

He pointed out the great importance of using copper for the conductor of the cable, free from all traces of impurity, on account of the extremely deleterious effect such impurities had on its conductivity. Many scientists at the time were opposed to this theory, but his insistence on its correctness led to the appointment of a special commission under Dr. Matheson for the purpose of making a thorough experimental investigation of the question. The work of that commission is quoted to-day as a basis of comparison, and at that date revolutionized the manufacture of copper for electrical conductors.

Other scientific men of prominence had formed the opinion that the opposition of the cable to the passage of current on account of its great length and high resistance copper, could always be overcome by increasing the battery employed. But, Professor Thomson knew at the outset that to increase the voltage was to attack the subject from the wrong side.

In 1865 his theory of the practicability of only using a minute power, one that could be generated in the bowl of a clay pipe or even in a lady's thimble, was fully demonstrated. He saw the need of a delicate and extremely sensitive apparatus which would respond to such a feeble current, and invented for the purpose that beautiful instrument, the "mirror galvanometer." The mirror galvanometer was employed on the 1866 cable and not only increase its efficiency, but probably has done more to reduce electrical measurement to an exact science than any other instrument ever invented.

In 1869 he made a still further advance by inventing the siphon recorder, which writes every signal passing through a cable. This instrument was introduced on long submarine lines in 1869 and the speaker had the honor of being one of of the first to work it. It was then in a crude experimental form.

Lord Kelvin's early investigations were carried out at a time when no exact standards of measurement existed, and while the world owes him much for the direct results of his work for submarine telegraphy, the placing of these measurements on a permanent and scientific basis is equally important. Remembering all these difficulties his mathematical work inspires one with profound admiration and respect, feelings which are doubly intensified when one thinks of the marvelous ingenuity and versatility which provided all manner of simple and efficient expedients to overcome the many difficulties that arose in his experimental labors.

His marine galvanometer, specially designed for ships, made it possible to accurately test cables while being laid or repaired, the motion of the vessel having no effect upon it. His was the wonderful mind that devised the means of making the submarine cable complete its purpose of linking the hemispheres together.

At the jubilee of his professorship of natural philosophy at the University of Glasgow, in 1896, his own inventions were used to convey messages of congratulations from every quarter of the globe. He acted as electrical engineer during the manufacture and laying of the 1865-1866 and other cables. In 1866 he received the honor of knighthood and in 1892 he was made a peer. He devised many standard instruments for making precise electrical measurements. These have been used in all branches of electrical work. His quadrant electrometer is largely used in submarine cable testing and is a fine example of that care and forethought which provided so fully for all the requirements of a given problem. He taught telegraph engineers the principles of their business.

Lord Kelvin was a profound thinker and a busy worker in many diversified subjects, but his interest in cable telegraphy never flagged. With his death the cable world has lost one of the pioneers and the greatest mastermind of the art, whose work will remain as a prominent and lasting testimony of the exactness and thoroughness in which he carried out everything he undertook. Submarine telegraphy owes so much to the labors and genius of Lord Kelvin that no history of the ocean cable could be written that would not be largely a history of his investigations, researches, discoveries and inventions.

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We who have worked submarine cables with his mirror galvanometer and with his siphon recorder, have tested them with his astatic galvanometer and with his electrometer, have calculated their speeds by his formulas, have located their faults by his methods and instruments, have sent out our repair ships guided by his compass, have taken our soundings in new waters by his sounding wire, how can we, who have been associated with him all these years, think of any part of our branch of applied electricity without at the same time thinking of William Thomson—Lord Kelvin. His figure looms so large with us that we deplore his death as an irreparable loss. Those who knew him and had the privilege of his friendship (and there must be many such here to-day), will dwell with deep and genuine regret on the sorrowful thought that his modesty and winning personality have passed into memory and will be seen no more.

After a life devoted with unsurpassed success to physical science and its practical applications, the mind that thought has fled to Him who bestowed it, the body that wrought rests among kings in that sacred pile where Britain lays and guards her illustrious dead, but his name and fame will endure world-wide, never to be forgotten while the sciences flourish.

Enlarging Telegraph Facilities at Denver to Accommodate Democratic National Convention.

General Superintendent Cook and Assistant General Superintendent McKisick of the Western Union Telegraph Company, together with Superintendent A. C. Thomas, of The Associated Press, recently visited Denver for the purpose of completing arrangements for telegraphic facilities for the Democratic national convention, which will be held in that city next June. The visiting officials met with the local committee and went over all of the arrangements thoroughly.

It is the intention to transform the basement of the auditorium into a big telegraph room and to have the operators work there and to arrange a system of pipes to carry the messages from the main floor of the auditorium to the operating room so that telegrams can be transferred without any trouble.

One of the greatest objections urged in the past against Denver as a convention city was that of lack of facilities for handling telegraphic matter. It was claimed that Denver could not handle that feature of the convention because it did not have a sufficient number of wires to carry so large a volume of business. The Western Union and Postal Telegraph-Cable companies propose to overcome this trouble. Wires will be strung from Denver to Cheyenne to connect with the transcontinental wires over the Union Pacific. They will also be strung to Colorado Springs, La Junta and Pueblo in order to connect with the wires running east over the Rock Island, Santa Fe and Missouri Pacific. Additional wires will be run over the Union Pacific to Kansas City and over the other roads to Omaha and also east until they come in contact with the wires running into the northwestern country by the northern route. In this way it is believed that the wire facilities will be ample to handle all business.

Gold and Stock Life Insurance Association Holds Annual Meeting.

The thirtieth annual meeting of the Gold and Stock Life Insurance Association was held in the Western Union Building, New York, January 20, and was well attended.

President Atkins said in his report: "Nineteen members who were on the roll with us a year ago have paid their last dues. This means a payment of $11,200 at $50 per month to their beneficiaries. It is not necessary to dwell on the good that these monthly payments have done during the past thirty years, nor on the good that future payments will do, until the call comes to the last man, but it is necessary that we should realize that it is only by adding to our surplus or reserve fund, that we can provide for the demands of the advancing age of our members."

Treasurer Dresdner's report showed gross assets of $21,179.31, from which deducting $6,900 in process of monthly payments to beneficiaries, leaves net assets of $14,279.31.

Secretary Dealy's report showed a membership of 1,147 at the close of the year, a loss of fourteen from the previous year, the unusual number of lapses being due to the depressing conditions that prevailed for a few months during the year.

The old board of officers were re-elected as follows: George W. E. Atkins, president; Gardner Irving, vice-president; W. J. Dealy, secretary; Lewis Dresdner, treasurer. Executive committee, G. W. E. Atkins, Gardner Irving, Herbert Smith, Lewis Dresdner, W. J. Dealy, Michael Breslin, Charles Shirley, T. A. McCammon and Albert J. Driver. Auditing committee, M. J. O'Leary, F. J. Nurnberg and J. J. Frederick.

The meeting concluded with congratulatory and enthusiastic addresses on the work already done, and on the prospects for future extension, by Messrs. C. P. Bruch, M. Breslin, M. J. O'Leary, G. Irving, W. L. Ives, and others.

Mr. J. C. Browne, of St. Louis, general foreman of telegraph of the Missouri Pacific Railway system, places this estimate on Telegraph Age: "The grand old Telegraph Age has been my standard bearer during the most active part of my life. Its columns have decided many problems for me, and it is a paper that I peruse with more interest than any periodical of the day. I do not wish to impress you with a burden of compliments to your paper, but I state candidly that it has been without question a strong adjunct to whatever success I have made in the telegraph business."

You can't afford to be without TELEGRAPH AGE; $1.50 a year.

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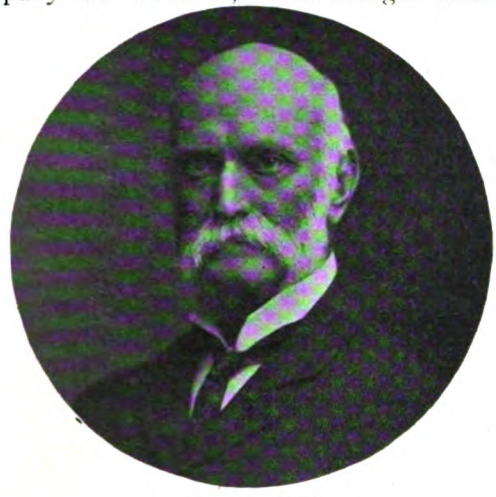
Representative Canadian Telegraphers.

ROBERT F. EASSON.

Robert Farmer Easson, superintendent of the commercial news and press department of the Great North Western Telegraph Company, Toronto, Ont., was born in Prinlaws, Leslie, Fifeshire, Scotland, in 1838. He went to Canada at an early age with his parents, and in 1849, entered the service of the old Montreal Telegraph Company at Toronto, as messenger and office



R. F. EASSON.
Superintendent Commercial News and Press Department, Great North Western Telegraph Company, Toronto, Ont.

boy, under John Parsons, manager, who, during the following season, resigned and was succeeded by H. P. Dwight, now president of the Great North Western Telegraph Company. In 1853 Mr. Easson, having become a full-fledged sound operator, removed to Chicago and engaged with the late Ezra Cornell, founder of Cornell University, to work in Chicago, making one of the half dozen operators then employed in that city. Subsequently he was transferred to La Porte, Ind., later to Plymouth and then to Logansport, that state. Upon completing a six months' term at the latter point, Mr. Easson returned to Chicago, where he remained until the fall of 1855, when, at the solicitation of Mr. Dwight, he returned to Toronto and again engaged with the Montreal Telegraph Company.

When Mr. Easson first arrived at Chicago the Morse system of telegraph was a crude and uncertain problem, having hardly emerged from the experimental stage. It certainly had not yet become a necessity, and it was far from a success in commercial and social life. Several of the operators in the Chicago office read by sound, but old-fashioned registers, with running tape were used on some of the lines. Mr. Cornell was indefatigable in his endeavors to keep his lines working, but as these ran along the highways, through the woods and across the prairies, they were frequently interrupted. Mr. Cornell spent much of his time in Chicago, and Mr. Easson, therefore, saw a great deal of that remarkable man. J. J. Speed, Henry O'Reilly, Judge Caton and other notable figures in the early history of the telegraph, were also frequent visitors to Chicago.

In 1859 Mr. Easson was appointed operator and Associated Press agent at Father Point, Que., his duties being chiefly to procure and forward to New York the foreign news despatches brought out by the ocean steamers, this being eight years prior to the successful operation of the first Atlantic cable. On leaving Father Point Mr. Easson returned to the Toronto office, and in 1864 became chief operator. This position he held until 1882, about which time the Great North Western Telegraph Company, having taken over the Montreal and the Dominion telegraph companies, he was appointed superintendent of the commercial news and press department, which position he still holds. Mr. Easson some years ago wrote a series of interesting articles on the early history of the telegraph. He has been fifty-nine years in the service.

DONALD E. HENRY.

Donald Eugene Henry, chief clerk to Isaac McMichael, vice-president and general manager of the Great North Western Telegraph Company, Toronto, Ont., was born at Napanee, Ont., April 23, 1877. He entered the telegraph service at Toronto in the employ of the company with which he has since remained, in April, 1899. His first position was that of stenographer and general clerk in the office of H. P. Dwight, president and general manger, from which he was promoted in September, 1901, to be assistant to Mr. Dwight. Four years later, in September, 1905, Mr. Henry

D. E. HENRY.
Chief Clerk, General Offices, Great North Western Telegraph Company, Toronto, Ont.

was appointed to the post he now holds, the duties of which he is discharging so acceptably. With characteristic modesty Mr. Henry in referring to his career describes it as being "prosaic and uneventful," emphasized only by "honest, hard work."

So sad, so fresh, the days that are no more.

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How a Banker Was Entrapped by an Alleged Wire-Tapping Game.

William F. Walker, the defaulting treasurer of the New Britain (Conn.) Savings Bank, whose defalcations amounted to nearly $500,000, told the following remarkable story to W. L. Rose, of the New York World, of his inveiglement and subsequent downfall by means of the too familiar wire-tapping game, by which he lost $300,000. One of the race wire-tapping swindlers, Whitney by name, "Big Al," who had make the acquaintance of Walker, said to the latter one day:

"I have a brother-in-law in charge of the racing department of the Western Union who can give me advance results on the races. He will hold up the returns to the poolrooms until he lets me know the result of a race and gives me time to lay a big bet. Then he lets the result of the race go in, we cash our bet and nobody is the wiser.

"Nothing could be simpler, but unfortunately all of my money is tied up and, for reasons which I cannot even tell you, I don't dare let my brother-in-law know how I am fixed. He gave me a tip on a real estate deal when the Pennsylvania Railroad was buying property for its terminal and I made $80,000 out of it. I am supposed to have that money now, but I lost it with all the rest of my ready cash in the stock market, and I can't take advantage of the chance."

Whitney went on to tell Walker in detail how easy it would be to beat the poolrooms with the co-operation of his brother-in-law, who, he said, was Mr. Mitchell. They would, he said, get the results of a race six minutes ahead of the poolrooms. All they had to do was to find a place where they could place bets large enough to make it worth while to take the risk.

It was arranged that Walker should meet the man described as "Mitchell." The next day, Tuesday, February 5, 1907, Whitney met Walker at the Grand Central Station at 12.20 P. M. They went to the Western Union Telegraph office, at No. 195 Broadway, and as they entered the lower hall they came upon an important looking man in his shirt sleeves.

"Why, hello, Al," said this man. "What do you want here at this time of day?"

Whitney introduced Walker, explaining that he was a friend of whom he had spoken.

"Well, we can't talk here," said the important looking person. They are holding a meeting of the board of directors up in my room now, but if you can wait and meet me over at Haan's cafe in an hour we can have a drink and a bite of lunch together and talk things over."

The man who posed as "Mitchell" was "Chicago Dutch," almost as notorious a swindler as Whitney and Gondorf. While Whitney and Walker were waiting for the man whom Walker supposed to be Mitchell, Whitney explained the terms on which they would have to do business. He told Walker he would have to be satisfied with one-quarter of the profits, as "Mitchell" would have to have one-half, and he, Whitney; would keep one-quarter for himself. But because of the certainty of making big winnings he told Walker that he ought to be satisfied as he ran no risk of losing anything.

"Chicago Dutch," posing as Mitchell, kept his appointment. It was explained to him that Whitney had his ready cash tied up in a real estate deal, but that Walker was a man to be depended upon and trusted under all circumstances—as good as gold and, incidentally, treasurer of a bank.

At first "Mitchell" made a pretense of being greatly disturbed because his brother-in-law had taken an outsider into their confidence. He refused to talk business until he had looked Walker up. They parted with the understanding that Whitney was to let Walker know as soon as arrangements had been made to put through their scheme.

Walker by this time was becoming enthusiastic over the easy money in sight and his only fear was that he would not be let in on the good thing. Whitney calmed his fears by telling him that "Mitchell," not knowing him, felt a little uneasy because he was not sure whether Walker could raise enough money to make the deal worth while.

"You go home and get $50,000 and bring it down here, and I'll see that you get a chance to place it," Whitney told Walker. "Come back tomorrow and I'll arrange another meeting with my brother-in-law. We'll let him see that we have the ready cash, and he'll go ahead and do business with us."

Walker, elated at the prospects, went back to New Britain, drew the money out of the bank and returned the next morning to New York. He met Whitney at the Hotel Belmont. An appointment was made with "Mitchell" and the three met again at Haan's. Walker showed him that he had the money with him and after some apparent hesitation "Mitchell" agreed to do business.

He told Whitney and Walker to find some house which would take any sized bet and as soon as they found such a place to let him know. Whitney was to call up his brother-in-law and give him the number of the telephone nearest to the place where the wager was to be laid. "Mitchell" suggested Canfield's, "Lou" Betts's and Frank Farrell's as likely places.

Whitney took Walker first to the places named by "Mitchell" as the banker supposed, but at each one there was found a "lookout" on guard who warned them away, saying the places were closed. These "lookouts" were, of course, in the employ of the gang and the houses at which they were posted were vacant buildings.

Finally, Whitney succeeded in learning that a place at No. — West Twenty-seventh street was open, but he was warned to be exceedingly careful, as the place was closely watched by the police. After many seeming difficulties they at last got into the house. They found a dozen men

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playing faro and roulette. Whitney had a whispered conversation with the supposed proprietor and told the anxious banker it would be all right for that afternoon, but they might have to look for another place next day.

Whitney called up "Mitchell" and gave him the number of a telephone in a cigar store across the street, as Walker supposed, telling Walker that his brother-in-law had agreed to send them in the winner of one race that afternoon ahead of the poolroom returns, so as to see whether everything was all right.

Walker and Whitney waited in the cigar store until the latter was called to the telephone. "Mitchell," Whitney said, had given him Coltness as the winner in the sixth race at New Orleans. Whitney gave Walker $100 and told him to hurry across the street and get it down on the horse before the race was "closed."

Walker rushed up to Charley Gondorf, who played the part of the bookmaker, and tried to lay the bet, but was told that he must have made a mistake, that they did not take such small bets there. Whitney, however, came to Walker's rescue and persuaded Gondorf to accept the $100, "just for this time." He explained that Walker was a close friend of his and was accustomed to make larger bets, but didn't happen to have any more ready cash with him just then.

Coltness was a 10 to 1 shot. The horse won, of course, and Gondorf handed Walker $1,100, at the same time warning him not to trouble the house again unless he was prepared to make a bet worth while. Walker was told that bets of any size would be taken and that if the house found that it could not carry as much as was offered it would lay a part of it off with other rooms.

They notified "Mitchell" of the good news, and he told them to call him up the next morning and he would make arrangements with them for that day. They spent the night together in New York and early the next afternoon they were waiting at the cigar store across the street from the poolroom. "Mitchell" this time gave Whitney Molo B as winner of the second race at New Orleans at 15 to 1. He told Whitney, so the "steerer" said, to have Walker get his $50,000 down on the horse. They hurried across the street and had no difficulty this time in laying the wager.

Two minutes later the returns came in, and it was announced that Molo B had won. Walker was almost crazy with joy and excitement. He fell on Whitney's neck and kissed him on the forehead. He was waiting in line to cash his bet when it was announced in the poolroom that Molo B had been disqualified. Walker dropped into a chair as if he had been shot.

Whitney, of course, already knew that the horse had been disqualified, having been so informed by "Chicago Dutch" who was stationed in a real poolroom, and was fully primed as to what he should tell Walker. He sympathized with the banker and finally they made an appointment to meet "Mitchell" at dinner at the Hotel York that evening.

Whitney bought a racing edition of an evening paper and there, sure enough, they found the account of the disqualification of Molo B after it had won the race. Walker's suspicions were fully quieted by Whitney and "Chicago Dutch," but his experience cured him for the time being of a desire to plunge as heavily as he had done that afternoon. "Mitchell" agreed with him, and it was arranged that only $10,000 should be risked the next day.

Walker went back to New Britain and returned the next noon with $10,000. He was told that there might be trouble in the house in Twenty-seventh street, but that possibly they might be able to do business on the last race of the day. This was done so as to get a short odds horse and let Walker win, as they did not care to tie up too much of their money. They were playing him for a bigger game and wanted to inspire him with enough confidence so that he would risk all he had on one play.

As on the other days, Whitney was called to the telephone in the cigar store and, as Walker believed, was instructed to play St. Valentine, a 2 to 1 shot. With $20,000 in his pocket, $2,500 of which was his profit on the transaction, Walker of course only regretted that he did not bet more than the $10,000. Whitney also seemed to be despondent, telling Walker that perhaps every poolroom in the city would be closed in a day or two and their chances lost.

The three had dinner together that night to celebrate their winnings, and "Mitchell" took advantage of Walker's enthusiasm to warn him of the foolishness of taking such chances day after day when they might have cleaned up $300,000 that afternoon just as well as not.

Walker agreed with him and when he came back from New Britain the next day he had $125,000. Whitney took him to the Twenty-seventh street house as usual, but they found it closed and were told that every poolroom and gambling house in the Tenderloin was likewise shut up. There was one house, however, so Whitney told Walker, where a few select patrons were admitted to play the races only. They were directed to No. — West Fifty-second street, which Walker, in his ignorance supposed to be Canfield's.

They found the parlor of this house fitted up in the manner of a poolroom with Charlie Gondorf there making books. Whitney found a telephone, No. 5250 Columbus, at the corner of Eighth avenue. This time Walker himself answered the telephone and was told to risk everything on a horse named Minnie J. He lost no time in laying the wager at odds of 15 to 1. The race was at the Hot Springs track. When the returns came in it was announced that Ina Gray had won.

The banker was furious and Whitney appeared to be equally enraged that their scheme had so

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miscarried. They rushed out to tell "Mitchell" how things had gone wrong, only to be accused of having bungled the job. "Mitchell" told Walker that he had mistaken the name over the telephone and that if he was not sure of the name he ought to have repeated it back. The whole blame was laid on Walker, and when they met at a hotel that night "Mitchell" went so far as to draw a revolver and threaten to kill Walker for his bungling.

"If I were sure you had bet that money right and were holding out on me, I would kill you on the spot," he told Walker. This threat was made in the grill room of the Hotel York.

Strange as it may appear, Walker was fully satisfied that his failure to win was due entirely to his own stupidity. He told the swindlers that night he was ready to take one more chance, but that he did not have any more ready cash and would have to negotiate some bonds. They told him they would fix that all right for him. Walker's only stipulation being that his name should not appear in the bond deal.

He returned the next day with a bunch of bonds and turned them over to Whitney, Fred Gondorf and Bob Nelson. The proceeds of their sale, as Walker supposed, were turned over to him, and the next afternoon, February 9, they got the name of Lens as the winner of the fifth race at New Orleans at 4 to 1. This time they used a telephone in the St. Paul Hotel, and to change their luck, as Whitney said, they went to another house, this time in Sixtieth street, a place given to them by "Mitchell."

Whitney here used the name of Jesse Lewisohn to inspire Walker with confidence. When they tried to enter the house at No. — West Sixtieth street, they were at first denied admittance, and when asked if they knew any one in the club, Whitney spoke of "Davy" Johnson and Lewisohn.

"I think Mr. Lewisohn is in," said the doorkeeper, and a moment later a man appeared who was addressed by Whitney as "Lewisohn." The "steerer" was greeted cordially and they were admitted. The man who posed as Jesse Lewisohn was "Mike" Farrell.

Walker was introduced to half a dozen well-dressed men in the house, and after they had had a few drinks together he was presented to the man who posed as bookmaker, who was "Johnny" Atkinson, a man well known in the betting ring at the tracks. He was told that he could make a bet of any reasonable amount, and happy in the thought that everything was arranged, they went out to wait for the tip from "Mitchell."

The banker risked $140,000 on Lens, after being almost forced to fight his way up to the cashier's window. He got 4 to 1, which he figured would give him enough money to make good all his losses and leave him independently rich for life.

"Lens wins!" was the announcement.

Walker was overjoyed. It meant that he would have $560,000 winnings, less what he would have to divide with Whitney and "Mitchell." But, as happened when he risked $50,000 on Molo B, something went wrong.

Before he had a chance to cash his bet it was announced that there had been a mistake in the "colors," that Lens, instead of winning, was not even in the money. Whitney rushed Walker out of the house, slamming the door behind him, and they hurried down to the Hotel York to meet "Mitchell."

While they were waiting Charley and Fred Gondorf dropped in and joined them at dinner. Charley Gondorf asked Walker in a casual way how he was getting on. Walker told him that he was done for; that he could not face his family and never expected to see New Britain again.

"I know I have been fleeced," he said, "but I am willing to take my medicine and end everything."

Gondorf took Walker to one side and talked alone with him for a long time, trying to cheer him up and promising to do everything possible for him, as he seemed to be a nice old man. Walker told him that even if he had back all he had lost it would not do him much good. Gondorf tried to induce him to go home, but Walker absolutely refused.

It was then arranged that Walker should send word to New Britain that he had committed suicide, which he did, but all the time his friends were mourning his death he was safe in the Hotel York.

The next day Gondorf took him to the barber shop under the Herald Square Hotel, and in the fourth chair from the front his beard and mustache were shaved off and his right eye was decorated with a patch. His hair was closely trimmed, and when he was provided with a new suit of clothes his best friend would not have recognized him.

Accompanied by Charley and Fred Gondorf Walker started the next day for Cuba, and with $20,000 in his pocket he was left in a little gambling house about two miles out of Havana, which was kept by a friend of the Gondorfs. Whitney went to London. Bob Nelson to Chicago and Mike Farrell disappeared.

The rest of the gang remained in New York, but so far none of them except Charley Gondorf has been arrested. Gondorf, as will be recalled, was arrested in the latter part of April and held in $20,000 bail for complicity in the swindle.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we sometimes have in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum, or even more. The growing value of complete files of TELEGRAPH AGE should cause our readers to carefully preserve their issues.

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The Care of Callaud Batteries.

John C. Barclay, assistant general manager and electrical engineer of the Western Union Telegraph Company, has issued instructions for the care of callaud batteries by employees of that company. These instructions cover the subject so thoroughly that we give them space, inasmuch as they afford information to many of our readers who stand in need of just such instructions here imparted. Mr. Barclay says that an inspection of the callaud batteries used by his company has disclosed the fact that many of the battery men and others in charge are ignorant of the proper manner of taking care of these batteries, or are wilfully careless. In many cases the jars, shelves and floors have been found covered with sulphate of zinc, the battery interspersed with cells containing no sulphate of copper whatever, and connections badly corroded, thus offering a high resistance.

These conditions indicate a waste of material and an insufficient current furnished to the lines. For the information and government of battery men, the following instructions are given:

When new battery coppers are received, they should be placed where they will not be exposed to extreme heat, or to the sun, whether they are in a box or not. They should be kept in a temperature that will not dry out and crack the insulation on the stem. In extreme dry climates, it may be necessary to immerse the coppers in water.

Place the copper plate, unfolded, in the bottom of the jar, carrying the copper wire to which it is attached upward and out at the top. Fill the jar with water to a joint about one and one-quarter inches from the top. For a new cell put in six ounces of sulphate of copper (blue vitriol) and place the zinc in position as directed. This should cause the water to be about one-half inch above the zinc. If no zinc solution is at hand to start the battery, connect on a short circuit until fit for use.

The zinc and copper solutions in this battery are separated by their own gravity, and this separation is easily maintained if not overcharged or interrupted. The blue solution should not be permitted to come in contact with the zinc, but should be separated by a clear white color line. When this rises to the zinc it indicates too great a quantity of sulphate of copper for the amount of work done by the battery. As the water evaporates more or less rapidly it will be necessary to add a little more from time to time, to keep the zinc entirely covered with the solution.

When the zinc solution approaches full saturation the sulphate of zinc creeps over the zinc hanger and par to the shelving; at the first outward indication of this the solution should be reduced by drawing off about one inch of the white portion of it. The degree of saturation may be indicated by the hydrometer, and should not be permitted to rise above twenty-five degrees. If the inside rim of the jar is occasionally coated with oil or paraffine, this spreading of the sulphate of zinc is in a measure prevented.

In large offices, where a thousand or more cells are used, the labor of filling up the jars with water is considerable, and as a small quantity of oil poured on top of the solution prevents to a great extent the evaporation (thus economizing labor), a small portion of oil may be used.

Ordinary batteries from which four or five lines are worked should be thoroughly cleaned once in three weeks.

The average life of a No. 1 Crowfoot zinc is about one year. The average consumption of blue vitriol is about eight pounds per annum for each No. 1 cell. Coppers are not consumed, and their life depends largely on the manner in which they are used.

Carefully remove the zinc, scrape off the adhering matter and wash well. Save the clean part of the solution, and pour it back into the jar after the latter has been thoroughly washed. In replenishing the cells with vitriol none of the crystals or crushed vitriol should be allowed to remain in contact with the zinc. Examine all connections, making each one right and perfect. The shelves should be thoroughly cleaned before the cells are replaced, and care taken not to splash the water when refilling the jars.

The temperature of the battery room should never be permitted to fall to the freezing point, and, on the other hand, should not be kept so high as to produce rapid evaporation.

The Development of Wireless Telegraphy.

During the reading of a paper on "Wireless Communications Over Sea" before the Institution of Engineers and Shipbuilders of Scotland, remarks the Electrical Review, the author, Dr. J. Erskine-Murray, who is a wireless telegraph expert, gave some interesting figures regarding the use of this new method of communication. From data which he had been able to get together, he found that there are now 1,550 wireless telegraph stations in operation. Of these, 195 are in commercial land stations, 170 are on merchant vessels, 150 are installed in lighthouses, 670 are naval installations, and fifty-five portable military installations. These are all intended for actual service, with the possible exception of the military stations. The remaining 310 are experimental stations. There are, therefore, nearly 1,200 wireless telegraph stations in actual service, which is an excellent showing when one considers that the art is only about ten years old, and progress was necessarily slow at first.

Another significant statement was that a vessel can always keep in wireless communication with England as long as she is not more than seventy miles from the coast. We used to be told that a vessel sailing around Great Britain need never lose sight of a lighthouse, but to-day she can make a much larger circle and still keep in communication with land, which is more than mere seeing.

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Reminiscences in the Busy Life of an Old-Time Telegrapher.

BY JAMES F. GORMLEY, OF BOSTON.

(Continued from issue of January 16.)

Wall street, in that part near to Broadway, in the late fifties and at the time of the breaking out of the Civil War, was the headquarters of the telegraph in New York. To one who is able to recall the appearance of the offices of that date, the receiving department sometimes being located on an upper floor, and compare all such with the immense and well equipped operating rooms with their great staffs of operators busily employed day and night, and housed in large buildings, especially designed for the purpose, the old conditions, viewed down the vista of retrospect, dwindle into small proportions. The period referred to was, so to speak, the provincial days of the telegraph. It was, however, destined soon to play an important part, and on a large scale, aside from its commercial uses, in providing a highly effective yet hitherto unknown quantity in aiding the operations of war. While up to this time the extension of the telegraph had been rapid, yet its advance had been, and naturally so, fragmentary in character, and its interests were divided. In this respect it lacked homogenousness. The business had, however, attracted to it men of intelligence and character, and the personnel of its operating forces ranked deservedly high. Many of the men of that day engaged at the key afterwards rose to distinction in the service. Neither ambition or opportunity were lacking to bar advancement. At 21 Wall street the New York and Washington House Printing Telegraph Company, where I was employed as an operator, had its headquarters; the receiving office of the Sandy Hook line was also located at this point, and here, too, was situated the office of the New York, Albany and Buffalo Telegraph Company. One of the operators attached to the latter, who afterwards attained recognition and place, was the late A. S. Brown. He subsequently became a superintendent of the Western Union Telegraph Company, general superintendent of the Mutual Union Telegraph Company, and later still electrical engineer of the Western Union Telegraph Company, a position he retained for many years, retiring from active service in 1902 on account of ill health. Mr. Brown died about a year ago. On still another floor of the building was found the National Telegraph Company, of which E. G. Ely was the manager. A Mr. Fish and a Mr. Porter were operators, and the line extended to Philadelphia, Pittsburg, Cincinnati, and so on to New Orleans. There were other telegraph offices further down Wall street.

At the time of which I write I worked the Washington wire. As it led to the national capital the circuit for those days was a heavy one. I had a temporary assignment to Baltimore to relieve Mr. Filer, and while in that city I worked alongside of John Lombard, between whom and myself developed a fast friendship. After my return to New York, political events preceding the memorable outbreak of the Civil War, were moving in rapid succession, and the wires were becoming more and more burdened with important despatches relating to the same. I remember with vivid clearness the John Brown episode at Harper's Ferry, Va., and how the occurrence fairly electrified the country, adding to the already excited state of public feeling. At the breaking out of trouble Governor Wise, of Virginia, with a company of state militia started for the seat of disturbance. In those days the business of the telegraph was usually suspended during the night time, as a rule the wires were not worked during the mid-hours of darkness. The John Brown tragedy provided an exception; it was an emergency case, and D. H. Craig, the general manager of The Associated Press at New York, instructed Mr. Fulton, the agent at Baltimore, to hold a wire open for the transmission of the expected news of the arrival of Governor Wise at Harper's Ferry, for the morning papers. When at length it was believed there was no chance of getting such a report, Fulton gave Craig "good night," and the message so received was delivered, the only remaining boy carrying the same being instructed that it would not be necessary for him to return. Shortly after, however, Baltimore called up the office with the request not to close, as news of a highly important character was coming through. Then followed a message announcing the arrival of Governor Wise and the soldiers at Harper's Ferry, the surrounding by the military of the barn in which John Brown had taken refuge, etc., all of which is a matter of history. It was startling information; something which the papers must necessarily have. I was alone in the office sitting with one boot on and the other off. Without waiting to adjust my foot gear, and grabbing up the despatch, I rushed down several flights of stairs to the street and then down Wall street, to The Associated Press office, my mad cap appearance of one foot booted and the other protected only by a stocking, creating asonishment to the few pedestrians I encountered on the way.

After I was transferred permanently to Baltimore, I used frequently to go over to Washington to help out on New York business. One night after closing the office, quite a party of us, including several newspaper correspondents, A. B. Talcott, the manager, "Pop," as we familiarly called him, and myself, called on the Hon. Anson Burlingame, the then newly appointed minister to China. He was a man then much in the public view, prominent in political life and highly esteemed. He was to leave Washington to start on his foreign mission on the following day. There was nothing especially memorable in this visit except the fact of the personal pleasure the call afforded me to meet so distinguished a citizen. I remember the interest expressed by Mr. Bur-

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lingame on the subject of telegraphy, in which he showed knowledge, when he learned of Mr. Talcott's and my occupation.

(To be continued)

Book Review.

The "Manual of Wireless Telegraphy," by A. Frederick Collins, must be accorded a position in the front rank of works of this kind. As every one interested in wireless telegraphy is aware, there are numerous books on the subject; but while this is true, there is, as a rule, very little information available for those who are, or who desire to become, operators. In preparing this manual the purpose of the author has been to give detailed and explicit instructions for wiring the various types of sending and receiving apparatus now in general use, the adjustment of the instruments, tuning and syntonizing the circuits, testing the devices, and finally the management of ship and shore stations. If this book be carefully studied and the instructions followed, it may be said that many of the difficulties usually encountered can be overcome by the operator, and he will be able to send and receive messages with a greater degree of confidence and of accuracy and over considerably longer distances than would otherwise be possible. In the preparation of his book, Mr. Collins has sought information from numerous leading authorities on the subject whose names are familiar as household words. The volume is bound in cloth, contains 232 pages and is abundantly illustrated. The price is $1.50, and will be sent on receipt of same to any point in the United States, carrying charges prepaid. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

The "Twentieth Century Manual of Railway Station Service," by Frederick L. Meyer, author of the "Twentieth Century Manual of Railway and Commercial Telegraphy," treats its subject matter with the same clear perceptions of what is needed by those who wish to become station, freight, ticket and baggage agents, such as distinguish the latter work in discussing the question of telegraphy in its application to both commercial and railway needs. The telegraph operator who also fills the position of station agent, will find in this book an unusual amount of information not otherwise readily available. It contains a great number of blank forms, covering all phases of the business, general laws, classification of freights, and special methods, all of which are helpful to the agent, it being the kind of enlightenment he requires. The subject of the telegraph is not treated in this work, but the book, together with the volume by the same author devoted to telegraphy, together constitute a source of direction and aid of pronounced value, which the railway telegrapher and station agent seeking knowledge, will find it advantageous to possess. The book is bound in cloth and embraces 216 pages; price $1.25, on receipt of which it will be sent to any address in the United States, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

T. E. Moreland as a United States Military Telegrapher.

Theodore E. Moreland is a member of the operating staff of the Western Union Telegraph Company, at Pittsburg, Pa. His telegraphic record dates back to 1860, when at the Outer Depot, Pittsburg, he was contemporary with Andrew Carnegie, who at that time was superintendent of the western division of the Pennsylvania Railroad. On the breaking out of the Civil War Mr. Carnegie became identified with the military telegraph, and in September, 1861, sent for Mr. Moreland, who in response to request became a member of the United States Military Telegraph Corps. In this capacity he saw much active service, his first assignment being at the headquarters of General Heintzleman at Fort Lyon, near Alexandria, Va. Later, on the Peninsula, he was stationed at Yorktown, Williamsburg and other points, and before Richmond during the seige of that city. He was at the second battle of Bull Run, an operator at General Fitz John Porter's headquarters, and at the court martial of the latter

THEODORE E. MORELAND.
Western Union Telegraph Company, Pittsburg, Pa.

for treason was called upon to identify despatches which passed between General Porter and General Pope, who then commanded the army. Mr. Moreland was always a firm believer in the loyalty and ability of General Porter and rejoiced when at last that officer was vindicated before his country. Eventually Mr. Moreland was captured by the enemy at Catlett's station, but was held in captivity only twenty-four hours, when, following his parole, he returned to his home. He was soon back again, however, and afterward was in service at the War Department. Mr. Moreland rendered efficient service to his country during the war period, and is remembered by his contemporaries not only as a skilful and resourceful telegrapher, but as a brave man.

Telegraph Age constitutes a "school of instruction" to every would-be telegrapher. It is accurate and authoritative and worth many times the price of subscription ($1.50) to any who would inform themselves respecting the telegraph.

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When J. D. Reid Was a Telegraph Superintendent.

Sidney B. Gifford, of Syracuse, N. Y., sends us a little brochure, quaint of type and brown with age, which records a "Birthday Presentation to J. Douglas Reid, superintendent, March 22, 1858, by the employees of the New York, Albany and Buffalo Telegraph Company." It appears that in response to a circular note addressed to all offices by A. Cole Cheney, at that time of the Rochester office, inviting co-operation in making a birthday present to the superintendent, a number of beautifully bound volumes, gifts emanating from five separate sources of that telegraph system, were tendered to Mr. Reid. The booklet was issued to commemorate the presentation, a proceeding which was conducted by Mr. Cheney in behalf of his associates, and to preserve the correspondence incident thereto. The occasion was Mr. Reid's thirty-ninth birthday.

In the order given the gifts were made: "Harper's Illustrated Family Bible," from the employees of the Eastern division of the New York, Albany and Buffalo Telegraph Company; "History of the Highlands and of the Highland Clans," four volumes, described as a "birthday token of respect," from the "telegraph offices between Syracuse and Niagara Falls, on the Niagara Falls roads;" "The Republican Court, or American Society in the days of Washington," "with the kindest regards and best wishes of the Rochester office and offices of the Genesee Valley Line;" "Burns' Complete Works," from the Auburn, Seneca Falls, Geneva and Canandaigua offices; "Specimens of the British Poets," which was accompanied by an appropriate note, dated at Syracuse and signed by John D. Stone, E. Payson Porter and Sidney B. Gifford, Syracuse, and William O. Shelley, of Rome. The following resolutions accompanied these gifts:

Whereas, We, the employees of the New York, Albany and Buffalo Telegraph Company, in view of the approaching birthday of our esteemed friend and superintendent, J. D. Reid, deem it an appropriate occasion to express our high regard for him as a friend, and satisfaction with him as a superintendent; therefore be it

Resolved, That since he came among us we have had no cause to regret his official connection; that, while he has been obliging and accommodating in favoring us, we have reason to know that he has been sufficiently strict and exacting to meet the approval of the board and to protect the interests of the company.

Resolved, That it shall be our aim and object to assist him in his arduous labors and, if possible, render them less arduous by a prompt and faithful attention to his orders and wishes.

Resolved, That in the presentation of our slight offering on his birthday, we only manifest in a small degree our esteem for him and satisfaction with his superintendency. May he be spared to hail the recurrence of many birthdays, and many like and greater tokens of friendship from those under him.

Resolved, That we hereby authorize A. Cole Cheney, to attach our several names hereto, and present the same to Mr. Reid, with our best wishes for his health, happiness and spiritual welfare.

Unanimously passed by telegraph, March 19, 1858.

Mr. Reid made this acknowledgement, addressing "A. Cole Cheney, Esq., on behalf of the employees of the New York, Albany and Buffalo Telegraph Company":

My birthday I have usually spent alone, employing its hours in communion with the absent whose affection for me was sweetest, and partly in the quiet review of the years that have passed away. A portion of this one has thus been spent, but you have not allowed it to close with its accustomed uneventful tranquillity. You have come to me laden with gifts as beautiful as they were unexpected, and, I fear, undeserved. And here they are, now that I am left alone again, piled up before me, speaking to me of an esteem which I have truly aimed to secure, but had no conception, until now, was so really and cheeringly mine own.

And how kind and appreciative has been your selection of these tokens, so valuable as gifts and so grateful to my tastes. They are volumes I prized and intended at some early day to secure. I am pleased that my purpose was delayed, for now I shall be able to take them from their shelves with the double joy of their genial company and the memory of your regard. There are few sources of truer sunshine to the heart than a conscious place in the affection of those whom we ourselves truly esteem. Such it is now with me. Those gifts shed a brighter light upon me than does the unclouded moon which now beautifies the night upon which they are bestowed.

What shall I say in thanking you for them? It troubles me to arrange the expression of it. My heart is framing sentences which Webster gives me no aid in uttering. I can only thank you heartfully and sincerely, recognizing in these beautiful gifts not only your own valued kindness and estimation of me as a friend and officer, but also of His hand who embroiders all earthly sympathies with the consciousness that He gives them their chief delicacy and clothes them with their purest delight.

A further note was also addressed by Mr. Reid to Messrs. Stone, Porter and Gifford, of Syracuse, and Mr. Shelley, of Rome, in answer to the one accompanying their gift.

In his communication to Telegraph Age Mr. Gifford, in reverting to telegraphic conditions as they existed in the state of New York a half a century and more ago, says:

"In 1850 the O'Reilly line, using the Bain instrument, and the New York State Printing Line, using the House instrument, were built, each with two wires, between New York, Albany and Buffalo, and opened in the fall of that year, when there were three competing lines along this route. The O'Reilly line was acquired by the New York, Albany and Buffalo Telegraph Company (Morse line) in February, 1854, and the House line in August, 1856. There was no opposition from the latter date until the United States Telegraph Company opened its lines in 1863.

"Upon the consolidation in 1856 Mr. Reid took charge of the New York, Albany and Buffalo system, continuing as superintendent until some time in 1865, when he joined William Orton in the management of the United States system, which, through Mr. Orton's efforts, was merged with the Western Union in March, 1866, the Western Union and New York, Albany and Buffalo company having in the meantime been consolidated.

"The executive offices of the New York, Albany and Buffalo company were located at Utica, but Mr. Reid made his home in Rochester, where he had resided from 1837 till 1845, being associated in business with Henry O'Reilly part of

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the time. Mr. Reid came from Scotland originally to Canada and was employed in a bank in Toronto during the so-called Patriot War in 1837, but being dissatisfied there he crossed to Rochester, where his subsequent connection with Henry O'Reilly led to his entering the telegraph field."

The Telegraph and Telephone in the Canal Zone.

W. J. Rodman, superintendent of telegraphs and telephones of the Panama Canal, sends to "Sound Waves" the following report, which shows how important a part the telegraph and telephone is playing in one of the greatest undertakings in history:

"Beginning with practically nothing, the telegraph and telephone department has to-day a line of eighteen wires from Colon to Culebra; twenty-four wires from Culebra to Panama, on iron rail poles along the railroad, and a line of eight to twenty-four wires from Bas Obispo to Pedro Miguel on creosoted wooden poles along the Canal prism. These wires are for the use of the excavation force in the Culebra cut, practically every steam shovel or other important unit in the cut being connected by telephone with engineering headquarters. It has established eleven telephone exchanges; installed eight hundred telephones, opened twenty-four new telegraph offices, making a total in all of thirty-two; erected twenty four-arm, iron mast, semaphore signals, with which has been established a manual block system with stations about two miles apart, with telegraphic communication from block to block.

"The wires are divided into uses as follows: eight for telegraph, three of which are used by the Central and South American Telegraph Company, one being in through circuit from New York to Buenos Ayres, leaving five wires for Zone use as follows: One train wire, one block wire, one through wire and two locals. There are also five pairs of telephone wires between Colon and Panama, with three additional pairs between Culebra and Panama.

* * * * * * * * *

"Three trunk lines, six wires, are of No. 9 copper wire: one trunk line, two wires, is of No. 12 copper wire; the telegraph and local telephone lines are of Nos. 9 and 10 double galvanized iron wire.

* * * * * * * * *

"The department has been called upon a great many times to make quick moves and changes in the lines. It has moved thirty-five percent. of the lines at different times and places, practically without interruption to communication. It has been called upon a great many times to have communication established quickly at different points without waiting for permanent work and material. This necessitated temporary work, to be later converted into permanent work without interrupting communication.

"The equipment installed is of the best quality. The instruments in use are the best made and the work done is better than is required in the United States. The weather and atmospheric conditions here are so unfavorable that it is essential to take precautions here that are altogether unnecessary in the states. Hard rubber for terminal strips must be used because wood exposed to atmosphere gathers moisture enough to cause current leakage and crossings.

"The extremely bad conditions here which would naturally cause undue cross talk from induction have practically been eliminated. Wherever possible, electric light wires have been run into the switchboards, placing four wires to six lights inside which are kept burning all night. The heat from the lamps keeps out moisture."

Mr. Tinker's Connection with the Bogus Proclamation Incident.

Editor TELEGRAPH AGE:

Reading the interesting article in Telegraph Age, of January 16, relative to the bogus proclamation, and Orton's account of the events transpiring at the New York end of the Independent Telegraph Company's lines, reminded me that I was "in it" at the Washington end, and, on reference to my journal of that date, I find a brief narrative which I will quote, assuming it may also be of interest to your readers:

"Wednesday, May 18, 1864.

"Great excitement in New York and throughout the country owing to the appearance this morning in the New York World and Journal of Commerce, of a bogus proclamation, purporting to emanate from President Lincoln, calling for 400,000 more troops and recommending a day for fasting and prayer for our country in her weakness. Secretary of State Seward contradicted it and pronounced it a forgery, and the Secretary of War (Stanton) ordered the arrest and confinement of the publishers; also military possession taken of the Independent Telegraph Company's lines over which it is supposed to have been transmitted from this city. Major Eckert with Colonel Wiswell, military governor, went down at noon and took possession of the offices of that company and placed me in charge of the main office on Pennsylvania avenue, between 12th and 13th streets. J. N. Worl, manager; Lock, chief operator, and Lithgon, Jacobs and Kanode, operators, with three clerks, are confined in the Old Capitol prison for examination. I remained in the office all the afternoon."

CHARLES A. TINKER.

Brooklyn, January 18, 1908.

The Dominion Minister of Public Works has stated in the House of Commons, that the receipts of the Yukon telegraph system from March 31 to December 11, were $52,725, the expenses $136,188, and there had been no expenditure on capital account.

This is a good time to begin a subscription to Telegraph Age, $1.50 a year.

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Serial Loan Association and Statement.

At the annual election of officers of the Serial Building Loan and Savings Institution of New York, held January 14, in the office of the corporation, 195 Broadway, New York, the following ticket was elected: J. C. Barclay, president; James R. Beard, vice-president; E. S. Butterfield, treasurer; E. F. Howell, secretary; J. B. Sabine and Alexander J. Schem, attorneys. Directors, F. J. Scherrer, J. B. Taltavall, T. A. McCammon, M. J. O'Leary, W. H. Jackson, J. F. Nathan, G. H. Schnitgen, M. S. Cohen, J. A. Hill, M. W. Rayens, T. A. Brooks, E. E. Brannin, G. W. Blanchard, F. C. Leubuscher, J.T. Laidlaw, J. T. Mulhall and W. J. Quinn.

The forty-sixth semi-annual statement of the Serial Building Loan and Savings Institution for the six months ended December 31, 1907, was as follows.

ASSETS.

Cash on hand	$2,057.54
Loans on mortgage	475,956.82
Loans on shares	7,995.00
Land contracts	17,521.67
Real estate	13,250.59
Advances	1,906.36
	$518,687.98

LIABILITIES.

Instalments	$292,231.00
Earnings credited	64,554.73
Juvenile savings	267.89
Matured shares	49,000.00
Prepaid shares	31,200.00
Borrowed money	36,353.80
Due on loans	10,050.00
Reserve	23,000.00
Undivided earnings	12,030.56
	$518,687.98

ELECTRIC BUILDING LOAN AND SAVINGS ASSOCIATION.

The annual election of the officers of the Electric Building Loan and Savings Association, of New York, was held January 10 in the office of that corporation, 253 Broadway, New York, when the following ticket was elected: J. J. Whalen, president; James R. Beard, vice-president; E. S. Butterfield, treasurer; Edwin F. Howell, secretary; John B. Sabine and Alexander J. Schem, counsel and attorneys. Directors, Edward Reynolds, M. J. O'Leary, W. H. Jackson, Eugene P. Tully, J. B. Taltavall, M. W. Rayens, T. E. Fleming, M. M. Davis, F. C. Leubuscher, G. W. Blanchard, G. H. Schnitgen, C. F. Leonard, M. S. Cohen, P. O. Purcell and J. T. Mulhall.

The thirty-fourth semi-annual statement of the Electric Building Loan and Savings Association for the six months ended December 31, 1907, was as follows:

ASSETS.

Mortgages	$37,465.24
Stock Loans	250.00
Land contracts	3,980.84
Advances	94.34
Cash	469.63
	$42,260.05

LIABILITIES.

Subscriptions	$36,964.16
Contingent fund	1,217.67
Borrowed money	3,100.00
Undivided earnings	978.22
	$42,260.05

Donald McNicol on the Wireless Telephone.

Donald McNicol, manager of the Postal Telegraph-Cable Company at Salt Lake City, Utah, read a paper on the wireless telephone on January 17, before the Utah Society of Engineers, which met in the Physical Building of the University of Utah, Salt Lake. He referred to the experiments of Preece, Bell, Shepardson, Kelsey and others in telephoning by means of induction, electromagnetic and electrostatic, by leakage through the earth's surface and through the air; also referred to the work of Ernst Ruhmer in Germany, taking advantage of the peculiar properties of selenium, when acted upon by means of a beam of light transmitted by the ether from a distant point. Mr. McNicol also spoke of Alexander Graham Bell's radiophone, in which he used the selenium relay. Experiments of Professors Simon, of Erlangen University, and of Dudell, in England, in perfecting the "speaking arc" by means of which ordinary sound waves are superimposed on the arc circuit, were discussed, as was the pioneer work of wireless telegraph experimenters in perfecting means of Hertz wave generation and propagation as applied to wireless telephone development taken up at a later date. The speaker touched upon frequency of the speaking arc increased by operating the latter in an atmosphere of hydrogen gas, and conducted experiments showing methods of generating Hertz waves, and manner of controlling their radiation. He also demonstrated methods employed to detect the presence of Hertz waves at distant points in space. Modifications necessary with wireless telegraph installations in order to transmit spoken words in place of Morse code signals, were illustrated, while a clear description was furnished of the experiments of Majorana in Italy, showing method devised for controlling the length of spark gaps without affecting the frequency. References to late improvements of Lee De Forest, using the audion Hertz wave detector, and to the work of Collins in perfecting wireless telephone for commercial purposes, and a consideration of the commercial applications of the new art, were concluding features of this interesting paper.

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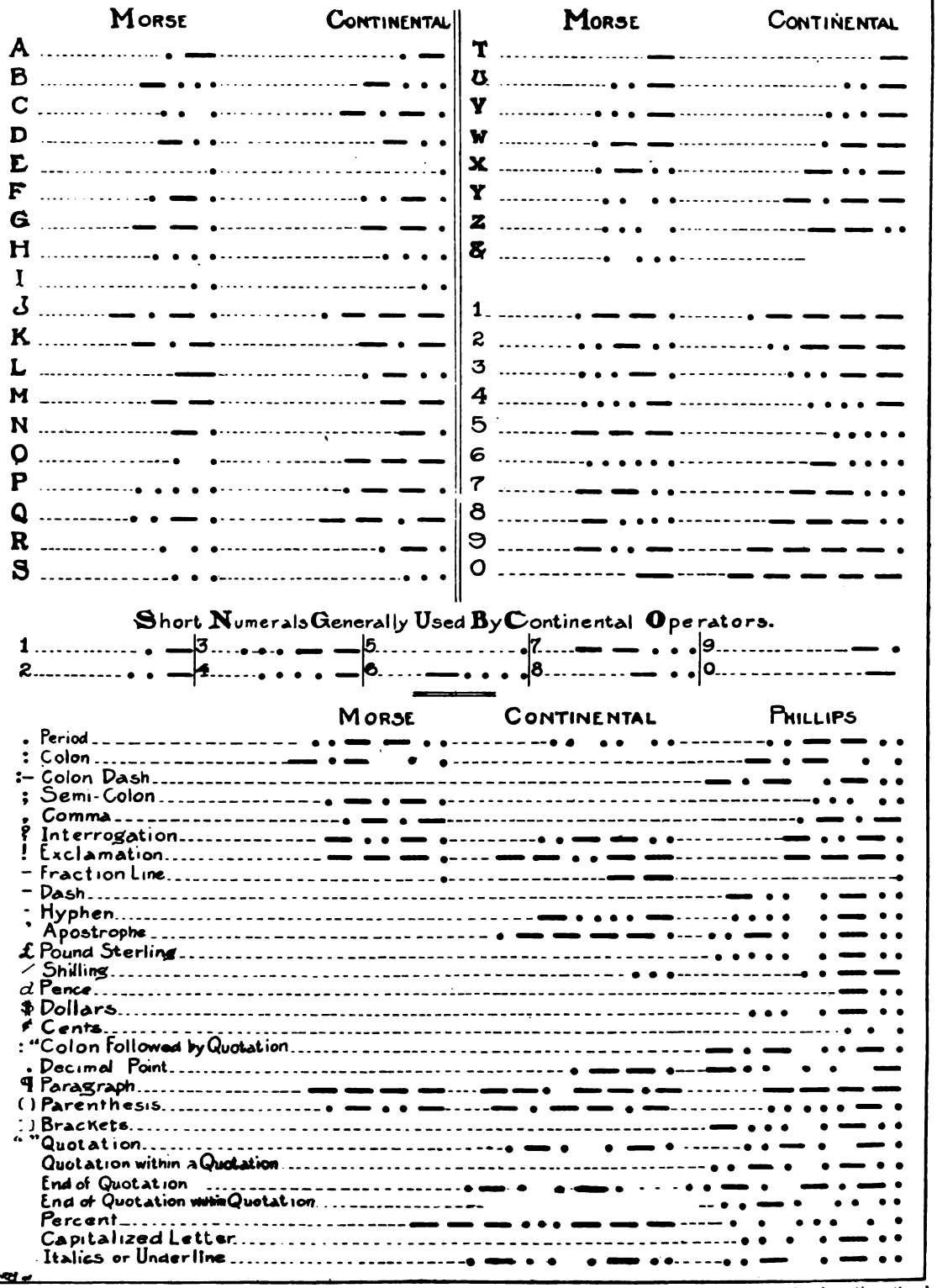

In the Phillips' Code, punctuation signals for fractions used generally in the United States are sent by inserting the letter e between the numerator and the denominator, thus: Three-sixteenths—3 e 16.

Owing to the fact that three ciphers when quickly transmitted bear striking resemblance to a figure 5, it will always be better to use tnd for thousand and myn for million when thousands or millions are expressed after the first, second or third figures by ciphers exclusively, thus: 10,000—tnd; 248,000,000—248 myns.

Hnd may also be used to advantage sometimes to express hundreds, thus: 400—4 hnd; 500,000—5 hnd tnd; 300,000,000—3 hnd myn.

Decimals should be sent by inserting the word "dot," thus: 0.34—O dot 34; 89.92—89 dot 92.

When an omission occurs in the copy, and the fact is shown by the presence of asterisks, the letter x several times repeated will indicate that asterisks are to be inserted in the copy to be sent out, thus: And this has been one of the results x x x x x Who shall account for such corruption—And this has been one of the results * * * * * Who shall, etc.

In sending poetry or one or more lines of verse, a paragraph mark (— — — —) should be used at the end of each line.

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Radio-Telegraphy.

Dr. Valdemar Poulson says he will this year have his wireless telegraph in perfect operation between Denmark and the United States.

A patent, No. 876,383, for a means for producing electromagnetic waves, has been granted to Joseph Murgas, of Wilkes-Barre, Pa. Complete diagram of circuits, including spark gap directly in aerial.

The Amalgamated Radio-Telegraph Company states that wireless telegrams between Newcastle England, and Copenhagen, Denmark, and Berlin, Germany, and Copenhagen, can be received on an inking recorder.

The Massie Wireless Telegraph Company will install five sets of apparatus in Alaska under a contract with the Signal Corps of the United States Army. It is stated that two of these sets are high-power apparatus, guaranteed to transmit messages over 400 miles of mountainous country.

A patent, No. 876,165, for a wireless telegraph transmitting system, has been issued to Lee DeForest, of New York. The combination with a transmitting loop antenna constituting a closed oscillating circuit, of a closed oscillating energizing circuit associated therewith and attuned thereto.

Five wireless telegraph messages have been received at Mare Island and Point Loma, Cal., from Sitka, Alaska. This is the record for long distance on the Pacific coast. The distance from Sitka to Mare Island is 1,350 miles, and from Sitka to Point Loma is a little more than 1,906 miles.

A patent, No. 876,281, for a combination sending and receiving wireless-telegraph apparatus, has been awarded to Albert L. New, of Los Angeles, and William N. Hickman, of Avalon, Cal. Two aerial capacities are insulated from each other, one contains the transmitting and the other the receiving apparatus. The transmitter is arranged so that the strength of its impulses can be varied. The receiver is provided with a local battery circuit and means for regulating its power. Ground connections are arranged to be connected to either circuit.

It is stated to be the intention of the Marconi Wireless Company to build at no distant day a new station at some point along the coast or in the vicinity of New York City. It is said that the experimental station at Glace Bay, Nova Scotia, which has been transmitting and receiving transatlantic messages since last October, has proved successful beyond expectation, averaging between 5,000 and 6,000 words daily. A large part of the business has been newspaper despatches, but numerous private messages have been sent, and the increase of business, it is claimed, will shortly necessitate operating the station day and night.

Ambassador Tower has cabled the state department from Berlin in answer to an inquiry as to the number of countries that had undertaken to execute the provisions of the wireless telegraphic convention of 1906, as follows: Belgium, Denmark, Mexico, Holland, Norway and Roumania have deposited with the German government ratifications of the wireless telegraphic convention. Argentina and Brazil have officially approved the convention, and are ready to deposit the ratifications. France awaits the ratification of Great Britain, while the German government has introduced in the Reichstag a bill to authorize ratification.

The system of wireless telegraph stations recently installed on the lower coast of British Columbia by the Dominion government has been successful in communicating over land sections, a thing which Superintendent Doutre, says the Canadian Electrical News, was sceptical about when the system was first installed. It was expected that Pachena and Victoria might have to talk through the medium of the United States station at Tatoosh, owing to the mountains intervening between Pachena and Victoria. This has not been the case, however, as communication is now going on regularly between the points mentioned. News of an unexpected record was received on December 29, however, when the operator at Victoria picked up the following: "This is the steamer Portland, off Cape Mudge, waiting for the tide." This message, sent from a point off Seymour Narrows, on the northeast coast of Vancouver Island, had to cross a high ridge of mountains, which, added to the distance of about one hundred fifty miles, is regarded as very creditable for the limited power of the station.

In the hearing given by the Senate committee on foreign relations on January 15, to John W. Griggs, formerly attorney-general of the United States, who presented the objections of the Marconi Wireless Telegraph Company to certain features of the treaty of Berlin in regard to wireless telegraphy regulations, that company rebels at the provision of the treaty requiring ships of all nations concerned in it to exchange or forward aerograms regardless of the system operating them. Through Mr. Griggs the company set forth to the committee that, through a general interchange of messages, it would not be protected as to its rights to maintain its invention for its own ends, and contended that its patents would be infringed. A further objection was made because the treaty provided no adequate compensation for general services thus rendered. United States Commissioner of Navigation Chamberlain was present at the hearing, as was also General Allen, of the army signal corps. On January 22 the committee listened to the argument of the Fessenden Wireless Company, which also is objecting to these provisions of the treaty.

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The Telegraph On the Continental Divide.

An episode occurring near that center of Extraordinary Happenings, Denver, to wit, is referred to in graphic language by the Republican of that city, in its issue of January 12. The seriousness of the affair, the result of which we are awaiting with some anxiety, takes on an especially grave aspect when vouched for by such eminent authorities for strict veracity of statement, actors on the scene, as "Old Farmer" Lawton, a man of local repute, and H. W. Plum, who has a good record as a United States military telegrapher to his credit, and who is a brother of Col. William R. Plum, the historian of that society.

The story runs:

There is a "bear" possibility that the Western Union will have to send a new operator within the next few days to Corona, on top of the Continental divide, if some key talk that came over the wire to "Farmer" Lawton is not resumed again to-day.

The conversation was between "Old Farmer" Lawton, of the Western Union, at a late hour last night and H. W. Plum, the agent at Corona, on the summit of the great Continental divide, where the company's carpenters had to melt the snow last summer in order to find a solid foundation upon which to place the depot, and is apt to change anyone's mind from seeking it as a winter resort.

The key talk was about as follows:

"Hello, there, Denver. Please ask 'Old Farmer' Lawton to the key. Ah, that's you, is it—guess I am a bit nervous, as I did not recognize your fist over the wire. Well, old man, I am glad to feel your familiar touch even at this distance, for, in addition to being boxed up here, I am in serious trouble. 'Old Farmer,' you have known me nigh onto 40 years. Did you ever know me to do anything really bad during that time, or shirk a responsible position? Was I not one of the first volunteers to go south and assist the telegraph companies when operators were dying like hogs with the cholera in the '60s? And did I not follow it up in the '70s by remaining at my post of duty during the great yellow fever epidemic?

The "Old Farmer" acknowledged that all this was true, and, in return, asked Mr. Plum what that had to do with his present troubles. If Plum was being held up by train robbers, he said he would see if assistance could not be sent him.

Mr. Plum took the circuit and said:

"No, no, old man—no tame affair like that. I have been held up so often it would really seem like a good joke now to be able to fool the next chap that shoves a gun under my nose. My present trouble is more serious than holding up my hands. The fact is, your old pard is mighty apt to pass in his checks before the next train pulls in to-morrow noon. I want you to pray for me, if possible, and if you can't, get someone else who can."

"Old Farmer" had just asked one of the messenger boys to repeat the Lord's prayer to him so that he could transmit it over the wire, when Mr. Plum broke in again.

"Old man, the situation is this: Last fall a good intentioned ranchman down the valley sent me a little pig—one of those black and white spotted shoats—thinking I would get lonesome up here among the clouds during the long, dreary winter months. Piggy has made a most congenial companion and I have kept him in the cellar, where the thermometer only goes down to 18 or 20 below zero. To-night I raised the trap door for the purpose of adding a couple of pounds to his frame with the scraps left from my supper, but instead of piggy greeting me with his usual grunt of appreciation, one of the largest grizzly bears that ever climbed a rocky mountain reached out for me and the remnants of my meal. I gave up the latter most willingly, and saved myself by closing the door and placing all the movable furniture in the office on it, but the old chap is not half as easily satisfied as my poor piggy that he has already eaten. If his claws and teeth hold out I see my finish before No. 6 reaches here to-morrow. If you will help me prepare for the final end you will be doing a turn that but few telegraphers ever ask of each other."

At 3 A. M. Mr. Plum was still mourning the loss of his porker, which he had planned to enter in the big Denver live stock show this month, but reported that Bruin had quieted down some in his efforts to relieve the Moffat road of its agent at that point.

The "Handbook of Wireless Telegraphy," by James Erskine-Murray, furnishes another contribution to the study and discussion of wireless telegraphy of a character such as to place this volume in the front rank of works dealing with the subject. It is a dignified and scholarly production. It furnishes a bright picture of the possibilities and the actual accomplishments of wireless telegraphy, yet the entire presentation of the question, comprehensive in its details, is treated in a simple, non-technical manner, well suited to meet the requirements of the student and the general reader. The history of wireless telegraphy is traced and a description of the appliances used for the product of high-frequency currents is given. The author makes a commendable attempt to set forth the problems of the laws governing transmission of signals to long distances and of the losses that occur through atmospheric absorption or other causes. The codes used in this country and those abroad, together with tables of electrical constants, are given. The book is bound in cloth, contains 332 pages, and is illustrated. Its size is 5½ by 8½ inches. It will be sent postpaid on receipt of price, $3.50. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progressive operator; $1.50 a year.

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Some Valuable Telegraph Books.

All of the books described in the following list embody a choice number from which selections may advantageously be made, and furnishes an excellent catalogue for the consideration of telegraphers, especially at this holiday season, when so many are desirous of selecting suitable books for gifts. Any book named will be sent upon receipt of price to any address, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York:

POCKET EDITION OF DIAGRAMS.

"Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students" is acknowledged on all sides to be the standard work of the telegraph. Speaking strictly within bounds, it is not too much to say that this volume presents the finest study of the complex subject of the telegraph ever attempted. There is no other book like it or even approaching it, in thoroughness, comprehensiveness, or in original detail of statement. The author, Willis H. Jones, is a practical telegrapher himself—an engineer in his profession of recognized ability, who knows exactly what other telegraphers want to know, and has the faculty of imparting that knowledge in a manner at once so clear, so simple, so bright, so entertaining, so free from needless technicalities, that his readers, even the least informed among them, readily understand his meaning. The helpful qualities of the work will be clearly manifest alike to the beginner, to the student, to the operator and to all telegraphers whether in the commercial or in the railroad service.

"Pocket Diagrams" does not deal in theory; it is packed full from cover to cover of the common sense of telegraphy, the side which the ordinary every day operator runs up against, and respecting which he desires information of the kind that will aid, not mystify, him. The book contains 334 pages, and has 160 splendid diagrams. It has the unqualified endorsement of telegraphers everywhere.

The price of "Pocket Edition of Diagrams," etc., is $1.50.

PHILLIPS CODE.

The popularity of the Phillips Code, by Walter P. Phillips, was never more apparent than at the present time. Its acceptance by the telegraphic fraternity, as a standard work of the kind, dates from its first publication, and the constantly increasing demand for this unique and thoroughly tested method of shorthand arranged for telegraphic purposes, has necessitated from time to time the issuance of several editions. The present edition was carefully gone over under the supervision of Mr. A. P. Velie, an expert press and code operator, for many years identified with The Associated Press, New York, a few revisions made and a number of contractions added, until now this "stanch friend of the telegrapher" is strictly up-to-date in every particular. It has been declared that an essential qualification of a "first-class operator" was a thorough understanding of Phillips Code.

Many expert code operators have examined the revised edition of this code, and all unite in pronouncing it perfect. Mr. George W. Conkling, who has won the championship for sending code in many tournaments, says:

"I have examined thoroughly the additions contained in the latest edition of the Phillips Code and most heartily approve of them. Every operator who is familiar with the code should find no difficulty in mastering the new contractions, as they 'fit in' smoothly and I think the ground has been entirely covered."

The price of the book is $1 per copy.

"Telegraphers of To-day," illustrating the personnel of the telegraphic profession, as it existed in 1894, with more than 900 biographical and historical sketches of leading members of the craft, is a unique and valuable work; it has become standard, being the only work of the kind extant. It contains 354 double-column pages 7 x 11 inches in size, has gilt edges and is bound in imitation morocco.

Of this fine publication, becoming more and more valuable as times passes, we have but a few copies left. The original price was $5. In order to readily dispose of these remaining volumes, and place them where they rightfully belong, in the hands of every telegrapher who failed to secure a copy at the higher original price, we have cut the figure to $2 a volume, express charges prepaid. At this low rate, a sum about the cost of binding the book, no telegrapher who desires to own a copy should fail to obtain one at this time, for this "bargain" price will probably never be repeated.

The life of Prof. S. F. B. Morse, is the standard work, authorized by the Morse family, and compiled from original papers and other authentic data in their sole possession. It is a clearly written biography, charmingly told by a trained newspaper man, a close personal friend, and presents the life of this great inventor of the telegraph in a broader, more intense, human and truthful attitude than ever before attempted or even made possible; 775 pages, illustrated; sheepskin binding. The original price was $6, which we have reduced to $3, on receipt of which the book will be sent, express charges prepaid.

"The Telegraph in America," by the late James D. Reid, the "father of the telegraph," furnishes an authentic and complete history of the telegraph, tracing out its early start, its development, the organization of the various telegraph and cable companies, etc. The book is bound in full Russia, has 846 pages and is abundantly illustrated; a magnificent gift to any telegrapher. There are now but a few copies left of this great work and when these are gone the work will be out of print. The original price was $7, but as the covers are a little shopworn the price has been reduced to $5.

"Sketches Old and New," by Walter P. Phillips, is a handsomely bound volume of 164 pages of interesting and charmingly told telegraph stories; one of the very best works of the kind ever published and which will appeal strongly to every telegrapher; price $1.

"Lightning Flashes and Electric Dashes," a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; price $1.50.

Old Timers' Souvenir—Miniature Legless Key. This is a beautiful emblem for operators; an attractive charm for the watch chain; a perfect duplicate in every detail of the celebrated miniature steel lever telegraph key that attracted so much attention and which was distributed as a souvenir at the banquet of the Old Time Telegraphers' and Historical Association at the Waldorf-Astoria, New York, August 31, 1905. It has a French lacquered body and nickel-plated lever. Price, by registered mail, prepaid, $1.50.

The Danish State Telegraph Department has established connections with an insurance company in order to put into effect a new plan for insuring telegrams, says the Western Electrician. The financial loss caused to business through the delay and distortion of telegrams is so considerable that the telegraph department for a long time has tried to find a way of insuring against these risks. The department itself could not take the responsibility for the losses, because that would involve raising the tolls on messages. When the new plan is put into effect any telegram can be insured for any amount, or a whole year's telegraphic correspondence can be insured up to a certain sum. Denmark is perhaps the first country to adopt telegram insurance.

Sample copies of TELEGRAPH AGE will be sent free to all intending subscribers.

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Letters From Our Agents.

PHILADELPHIA, WESTERN UNION.

John C. Becker, manager of the Philadelphia and Reading telegraph office at Boyertown, lost his wife and two daughters in the recent horrible theater fire in that place. The tragedy has awakened a sentiment of profound sympathy in this office.

P. H. Nunan has been transferred from the Third and Chestnut streets office to the main office.

Mr. and Mrs. George W. Uber (nee Miss Anna Heilman) are contemplating a trip to Europe in the near future.

C. B. Wood will also soon leave to make a tour of Europe, visiting his old home in England. Mr. Wood came to this city over twenty-five years ago from London and was one of the oldest printing operators; since their abolition he has been working a Morse wire, at which he is as proficient as on the printer.

NEW YORK, WESTERN UNION.

Mr. T. A. Brooks, timekeeper, has gone South on two months' leave of absence owing to ill health. His place is ably taken care of during his absence by Mr. Tepe.

William Winter, formerly of this office, and lately employed at Ramsey, N. J., died at Liberty, N. Y., on January 20. The funeral was held at the former place.

Mrs. Henry, the wife of Charles Henry, a well-known telegrapher, while en route to New York from Oakland, Cal., with her husband, was taken ill and died in a hospital at St. Louis. Mr. Henry was the Western Union division chief at San Francisco and previously had held a similar position at St. Louis. Mrs. Henry was buried at Jacksonville, Ill.

OTHER NEW YORK NEWS.

The Morse Electric Club will hold its first annual dinner on the evening of Saturday, February 29, at the Hotel Breslin, New York.

Assessment No. 474 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of Earl J. Fox, at Telluride, Colo.; Henry C. Derr, at New York; J. Newton Marshall, at Philadelphia; James H. Fleshman, at Philadelphia; Charles W. Wise, at Evansville, Ind., and Charles W. McReynolds, at Denver, Colo.

The New York local of the Commercial Telegraphers' Union of America gave its seventh annual entertainment and ball at Palm Garden on the evening of Monday, January 27. The proceeds were for the benefit of unemployed telegraphers, members of this association.

St. Louis Telephone and Telegraph Notes.

Three new sections of test board, including a Morse and leased wire board have been installed in the American Telephone and Telegraph Company wire chiefs' office at St. Louis. New duplex and repeater equipment is also being installed which will about double the Morse wire facilities of the office.

The second annual banquet and smoker of the Bell Society, an association of the American Telephone and Telegraph Company's employees in that city, was held on the evening of January 10. The occasion was enlivened by speeches, recitations and songs and a mock trial, and was greatly enjoyed.

Fred L. Mounce, late of the wire chief's force here, is now with The Associated Press at Kansas City.

P. G. Trotter, late wire chief at Little Rock, Ark., has been transferred to the St. Louis wire chief's force.

What is known as The Morse Code Telegraphy Instructor, or pianoforte telegraphy, designed for the practice and study of the Morse code on the piano, is the invention of Russell B. Griffin, of Quincy, Ill., an old time telegrapher and member of the United States Military Telegraph Corps. His invention is ingenious. It adapts the Morse code to the keys of the piano by means of musical notation. Mr. Griffin, who suffered a stroke of paralysis some ten years ago, is also placing on the market the "Telegraphic Clicker and Instructor," a telegraph device designed for learners. It operates on the snapper sounder principle, and is sold at twenty-five cents. These goods are being handled by the Morse Art Company, of Quincy, Ill.

Mr. Griffin entered the telegraph service in 1855, and holds a certificate of honorable service during the Civil War as operator and chief operator from April 1, 1862, to November 25, 1865.

Philadelphia Electrical Aid Society Election.

The twentieth annual meeting of the Philadelphia Electrical Aid Society was held on Monday evening, January 13, in Mayer's Drawing Rooms, with an attendance of over two hundred and fifty. The old officers were unanimously re-elected as follows: Andrew S. Weir, president; J. W. Fitzpatrick, vice-president; W. E. Vanarsdale, recording secretary; Robert C. Murray, financial secretary, and H. W. Hetzel, treasurer. Executive committee, F. E. Maize, Miss Anna E. Foster and Miss Mary McFadden. Trustees, George J. Wells, William Miley and H. C. Leahy. The report of the secretary showed a total membership on December 31, 1907, of 701; receipts during 1907, $4,006.52; disbursements during the same period, $3,259.67, a net gain for the year of $746.85. This, with the surplus on hand, places $5,431.41 to the credit of the society, a solid foundation for the good work being done by it. Sixty new members were admitted at this meeting and an amendment to the by-laws was adopted, raising the death benefits from $50 to $100. Ten reinstatements and five new members will be admitted at the regular monthly meeting. After the meeting adjourned supper was served.

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American District Telegraph Report.

The American District Telegraph Company of New York, held its annual meeting on January 23. The total revenue for the year amounted to $586,065, a decrease of $17,577. The net revenue amounted to $79,028, out of which $76,888 was paid on dividends, leaving a surplus of $2,140.

Col. R. C. Clowry, the president, said that the telegraphers' strike was responsible for the decrease in earnings. The company reduced expenses very materially as a result of the strike and the business depression. The balance sheet disclosed that old accounts now considered worthless, amounting to $15,381, were written off. In addition $15,895 was charged off for old call boxes. The old directors were re-elected.

General Mention.

The animus of the Commercial Telegraphers' Union toward the telegraph companies, growing out of the strike of last summer and fall, is shown by the fact that a bill is being prepared under the influences of this organization for introduction in the House, requiring telegraph companies to put the time of filing and the time of sending as well as the time of receipt, on all messages handled. This action evidently is in line with a bill providing for government ownership of the telegraphs emanating from the same general sources. There is, however, no prospect that Congress will give this subject much consideration at the present session—the tendency being to shy at everything in the way of new legislation that can be avoided or postponed.

The Western Union and the Postal telegraph companies were made defendants in a contemplated suit instituted January 8, by the Nebraska railway commission, and to be filed in county court asking for the penalizing of the companies on account of the failure to file statements of their business with the commission as required by the statutes and for changing rates without the consent of the commission.

The twenty-third annual ball of the Telegraphers' Mutual Aid Association, of Boston, was held at Odd Fellows Hall, in that city, on the evening of January 31, a large number being present. Thomas F. Clark, chief operator of the Western Union Telegraph Company, Boston, is president of this association, and W. J. Mahoney, secretary.

Mr. James Kent, general manager of the telegraph department of the Canadian Pacific Railway Company, Montreal, Que., expresses his opinion of Telegraph Age in the following complimentary terms: "I am much pleased with the general tone and character of the paper, and trust you may find it as profitable as I find its pages both interesting and instructive."

John R. Walsh, of Chicago, at one time a prominent newspaper man, and formerly the treasurer of The United Press, was recently found guilty of misappropriating the funds of the Chicago National Bank. He was convicted on fifty-four counts.

The hardships imposed by the operation of the eight-hour law in Wisconsin began to be apparent in that state. It is demanded by the state railroad commission that the smaller railroad and telegraph offices within that commonwealth, recently closed, shall be reopened.

Hon. P. V. DeGraw, fourth assistant postmaster-general, Washington, the well-known old time telegrapher and newspaper correspondent, in writing to renew his subscription to Telegraph Age, says: "I should, indeed, be very lonesome without it."

Mr. A. A. Briggs, chief operator of the Postal Telegraph-Cable Company at Cleveland, O., who was stricken suddenly with a mild stroke of paralysis on January 13, is still confined to his bed. Absolute rest has been declared to be necessary for recovery.

What a man saves, not what he earns, makes him rich. Few men begin life wealthy. It is by saving alone that you can become independent. Independent means freedom from the drudgery of life. Consult the Serial Building Loan and Savings Institution, 195 Broadway, New York.

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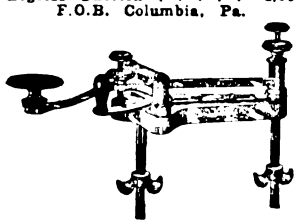

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Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

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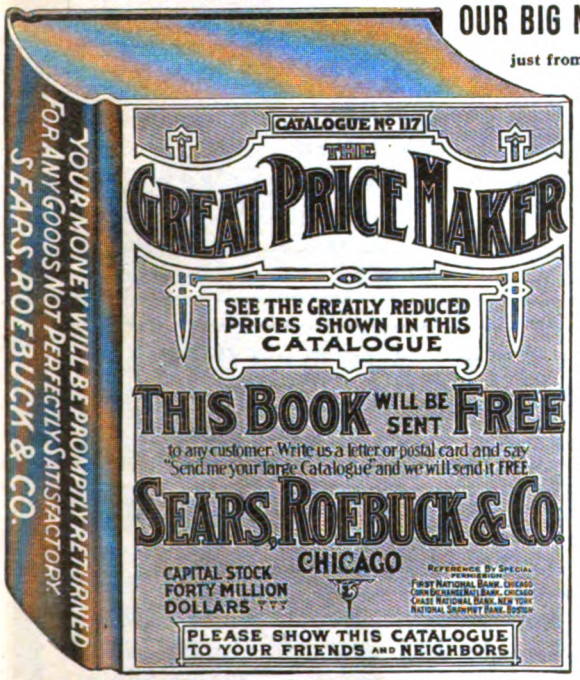

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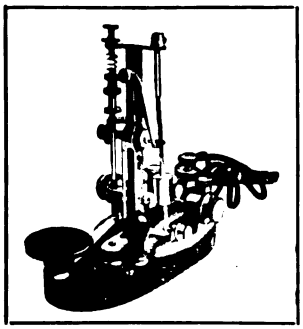

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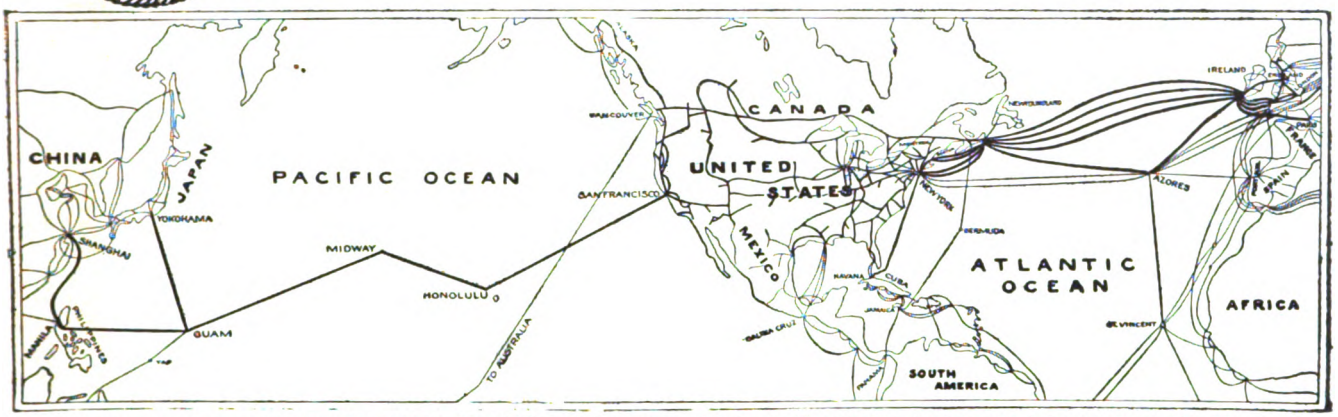

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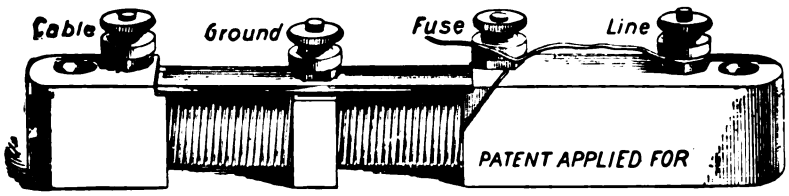

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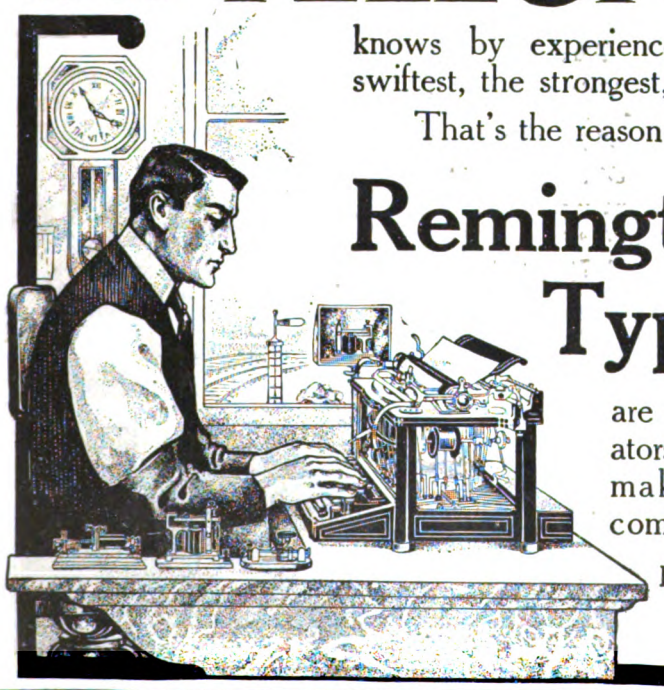

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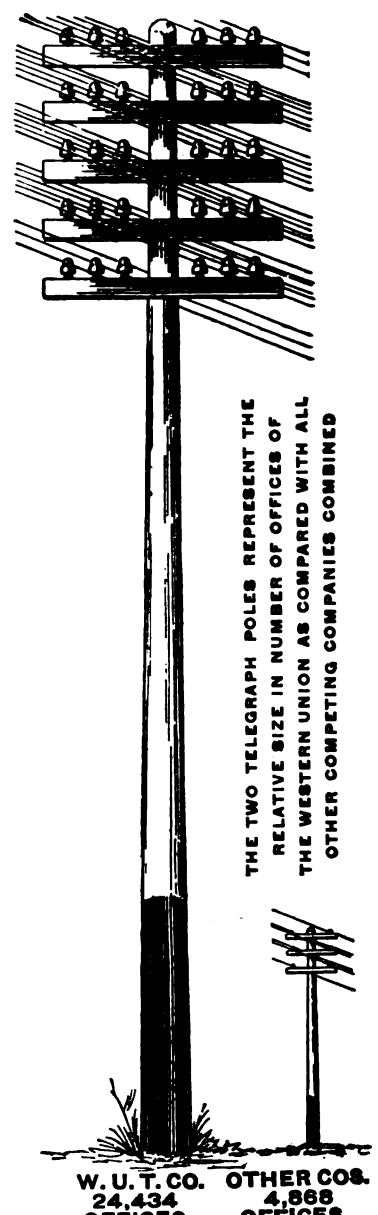

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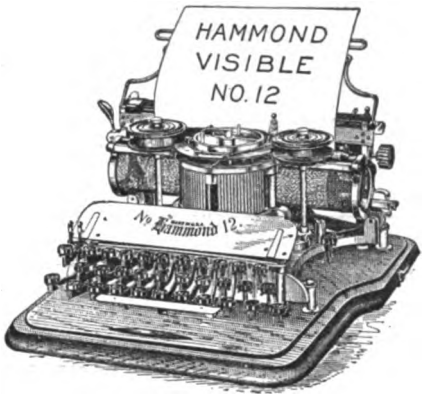

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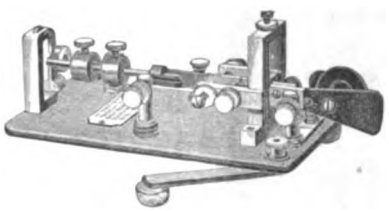

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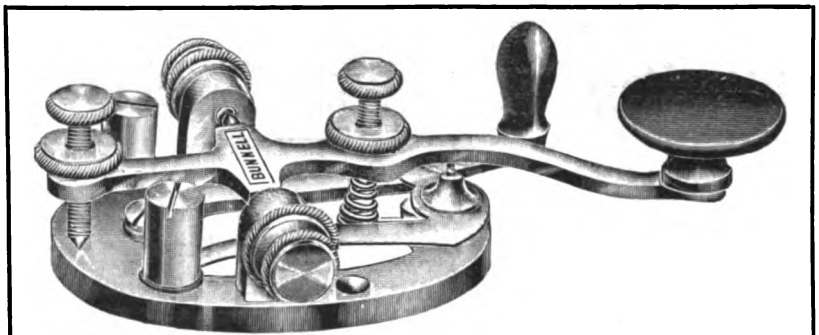

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No. 4. NEW YORK, FEBRUARY 16, 1908. Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

How to Become a Wire Chief.

BY WILLIS H. JONES.

Part IV.

One of the nice points a wire chief is called upon to determine in wet weather is that of the working value of a wire. That is to say, he must be able to tell pretty closely by the existing conditions of the wire whether it will duplex or quadruplex satisfactorily before restoring the same to a multiplex circuit.

On the broad ground that, as a rule, nearly every merely watersoaked wire that will permit of single line conversation with the terminal station will duplex fairly satisfactorily, a careless or inexperienced wire chief may make the mistake of letting it go, only to learn later that a closer test was required.

One cannot measure the value of a wire with any great degree of accuracy by the mere volume of current that flows into a conductor purposely opened at the distant terminal; that is to say, by the amount of "escape" as indicated by the ammeter. Everything depends upon the nature of the leak. As a matter of fact, it often happens that of two similar wires showing two different values of escape the one showing the greater leakage will "duplex" while the one of lesser volume will not. Furthermore, the conductor which will not duplex may possibly show up best, measured by the single line conversational test.

Now, an investigation of the matter will probably disclose the fact that the "escape" on the circuit which will not duplex, is the resultant of two different values of electromotive force and would therefore be inconstant in volume in a duplex circuit operated by two different polarities of battery.

In other words, it will be found that the "escape" in the unworkable conductor is due to a light or high resistance cross and represents that volume of current which flows down the wet poles from the home battery plus, or minus, as the case may be, the current created or opposed by a foreign electromotive force in an adjacent circuit, via the wet crossarms; that is to say, possibly a wet-weather cross. A wet-weather cross differs from an ordinary cross only inasmuch that there is no metal or other actual contact between the two wires other than that due to the high resistance film of water on the wooden crossarms.

It is obvious, therefore, that such a wire restored to a duplex circuit would be useless because the two polarities of battery belonging to the apparatus would cause different volumes of current to flow in the wire according to whether the electromotive force was opposed or aided by the foreign pressure, hence one's inability to adjust for both.

The other wire mentioned might "duplex" satisfactorily with a small working margin, despite its greater leakage, simply because the escape is due to the even pressure of the home battery alone, and for that reason would show even values of current with either polarity of the duplex battery to line. One adjustment of the apparatus, therefore, suffices and duplex operation becomes possible. To determine whether a slight cross of this kind exists or not ask the terminal station to open the circuit temporarily and then alternately place positive and negative battery to line and note the deflection of the needle of the ammeter. If there is no wet-weather or other cross between it and another live circuit, the amount of escape shown will be practically the same with either polarity of battery connected, provided the pressure of the latter is identical, as is supposed to be.

If the wire is crossed the ammeter will show a difference in the volume flowing when one polarity is substituted for the other. When such inequality of conditions is found to exist in a conductor in a marked degree, it is hardly advisable to restore the same to a multiplex circuit, especially if the latter is a quadruplex circuit.

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As previously remarked it is not always necessary to use an ammeter to ascertain these facts for the reason that in time an observing wire chief is able to readily detect the discrepancy by means of his single line test relay alone. There are times, however, when the discrepancy between the two values is too small to detect by means of the test relay, yet sufficiently marked to interfere with rapid automatic operation. In fact, a milliammeter itself often fails to show anything particularly wrong with a conductor, while at the same time a voltmeter will disclose quite a marked unsteadiness in the condition of the circuit. Hence, in using these instruments indiscriminately allowance should be made for the greater sensitiveness of the latter, as it seems to readily pick up every legitimate and foreign influence that exists in the suspected wire and adjacent conductors. For ordinary tests for insulation, however, the milliammeter is quite reliable and trustworthy and the needle is sufficiently steady to give a readable value. On the other hand, the needle of a voltmeter in the same circuit often varies its position so rapidly that one has to guess at the real value of the deflections.

If proper precaution is taken to get the exact reading of the dial of a voltmeter; that is to say, note even the fraction of a division over which the needle is deflected where the total deflection is not very great, the voltmeter may be satisfactorily substituted for the galvanometer in nearly all cases of ordinary wire testing for conductivity and insulation encountered at the main line switchboard.

A convenient formula for computing such measurements by means of the voltmeter alone is as follows:

$$X = VR\left(\frac{E}{E'} - 1\right).$$

Where X = The resistance to be measured,
E = The electromotive force of the battery used, disconnected from the wire, or first reading,
E' = The electromotive force of same battery with the wire connected, or second reading,
VR = The known resistance of voltmeter.

The formula interpreted means that the known resistance of the voltmeter is to be multiplied by the quotient obtained by dividing the first reading by the figures of the second reading, after 1 has been subtracted therefrom.

Example: What is the resistance of a wire where the voltmeter gives 140 volts for the first reading and 130 volts for the second, and the known resistance of the meter is 42,000 ohms?

In plain arithmetic this would read:

$42{,}000 \times \left(\frac{140}{130} - 1\right) = 3{,}234$ ohms. Or, $140 \div 130 = 1.077$, which leaves a remainder of .077 after 1 has been subtracted; and .077 multiplied by 42,000 = 3,234, the resistance in ohms of the wire measured.

Another and perhaps quicker method of measuring conductivity resistance is to use an ammeter in conjunction with the voltmeter, and then work out the answer by the simple formula

$$\frac{E}{C} = R.$$

The ammeter will give the value of the current C, and the voltmeter that of E. In this case the value of E will correspond with that of E' in the previous formula given. The object of getting this equivalent of the "second reading" value, where the initial pressure of the switch battery is already known, is to eliminate the necessity of finally subtracting the uncertain value of the battery lamp resistance from the quotient obtained, as would be required were the initial value of the battery's electromotive force be taken to represent E in the latter formula.

(To be continued)

Recent Telegraph Patents.

A patent, No. 876,952, for a release mechanism for Morse telegraphs, has been issued to Eugene Ducretet, of Paris, France. A device for automatically or manually arresting the paper feed mechanism of a Morse receiving instrument whereby the paper feed is controlled by the operation of the machine.

A patent, No. 877,002, for a telegraph system, has been taken out by Harry O. Rugh, of Sandwich, Ill. Complete telegraph system having operating battery at each station and means at one sending station and governed at another sending station for preventing the connection of battery thereat with the line.

A patent, No. 877,101, for a clip for fixing wires to insulators, has been granted to Johann Macek, Vienna, Austria-Hungary. A form of cleat for fixing conducting wires to insulation. Has a plurality of wire links which are engaged around the insulators by a thumb-nut.

A patent, No. 877,242, for an insulator pin, has been awarded to Delos V. Snapp, Holdrege, and Charles W. Fraher, Lincoln, Neb. A form of insulator pin having a base bolted to the crossarm and a threaded plug thereon which receives the insulator.

A patent, No. 877,555, for telegraphy, has been obtained by Patrick B. Delany, of South Orange, N. J. Covers a telegraph transmitter having a key movable in a horizontal plane between two contacts and actuating relays which transmit dots and dashes, respectively.

A patent, No. 877,822, for a printing telegraph, has been awarded to John C. Barclay, of New

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York. Printing telegraph of a class having finger keys and synchronously operated commutators or "sunflowers" at both the transmitting and the receiving station; covers details of construction.

A patent, No. 877,857, for a telegraph switch, has been taken out by Lewis H. Parcels, of Hiawatha, Kan. Telegraph switch for connecting a resonator sounder into one or more sets of telegraph instruments without disturbing the circuits, but allowing all local circuits to work free and clear when the resonator is cut out.

The following patent has expired:

Patent No. 445,442, for a telegraph key, held by J. Doggett, of Plain City, Mo.

Personal.

Mr. I. McMichael, vice-president and general manager of the Great North Western Telegraph Company, Toronto, Ont., accompanied by his wife, has been absent recently on an extended vacation in Florida.

Mr. David R. Downer, for many years previous to 1880 assistant manager of the Western Union main office in New York, and a brother of Alfred S. Downer, the then manager, who has been seriously ill, has gone abroad for the benefit of his health and will be absent about a year. For the past quarter of century Mr. Downer has been engaged in the business of gold and silver refining in Newark, N. J.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Col. R. C. Clowry, president and general manager of the company, together with his private secretary, F. J. Scherrer, Mrs. Henry D. Estabrook, Frank Jaynes, general superintendent of the company at San Francisco, the latter accompanied by his wife, have returned from Florida, where they spent the month of January. Mr. and Mrs. Jaynes left New York for San Francisco on February 6. Mr. Jaynes, who has been ill, returns to his home much improved in health after his sojourn of two months in the East.

The dinner of the Morse Electric Club, announced for the evening of Saturday, February 29, at the Hotel Breslin, promises to be an enjoyable affair. Col. R. C. Clowry will be the guest of honor. An interesting programme of entertainment has been arranged for the occasion. Mr. John B. Van Every is president of the club. The committee of arrangements consists of P. J. Casey and R. J. Murphy, F. J. Scherrer being the secretary.

Barclay printers have recently been installed on the following additional circuits: New York and Washington, New York and Cleveland and Washington and Chicago.

Mr. Charles W. Holmes, executive messenger, reached his seventieth birthday on Monday, February 10, and was the recipient of numerous congratulations on the part of office associates and other friends.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Edward J. Nally, vice-president and general manager, who, with Mrs. Nally, spent two weeks at Atlantic City recently, is again at his desk.

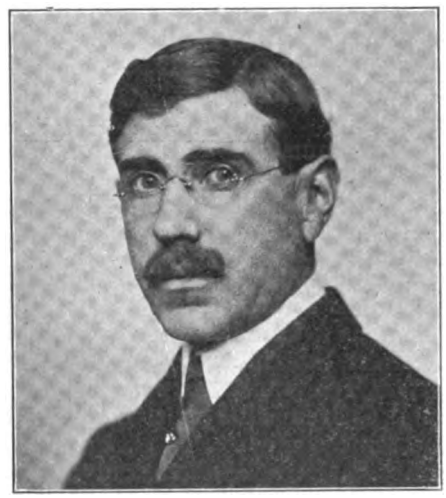
Mr. Edward G. Cochrane, general superintendent, who is absent on leave because of impaired health, is rapidly regaining his strength.

Mr. W. S. Wood, a prominent lawyer, who was for many years the local counsel for the Pacific Postal Telegraph-Cable Company at San Francisco, died January 30.

Mr. J. T. Needham, formerly identified with the electrical engineer's department of this company, now engaged in other business, was a visitor in this building a few days ago.

C. F. Leonard, Postal City Superintendent.

Christopher F. Leonard, who an January 1 was promoted to be superintendent of city offices, from the position of assistant superintendent,



CHRISTOPHER F. LEONARD,
City Superintendent Postal Telegraph-Cable Company, New York

of the Postal Telegraph-Cable Company, New York, is a gentleman yet young in years, who has won preferment in the service because of intelligent and diligent application to duty. Mr. Leonard was first employed by this company as an operator. He has since filled the post of assistant traffic chief; has held the managership of a number of different local branch offices, also serving for two years as manager of the Buffalo, N. Y., office, and another two years at the head of the Brooklyn district. He was called to the main office in May, 1907, and assigned to the position from which he has been recently advanced. His record has been an exemplary one, and his marked executive capacity is responsible for his recent promotion. Mr. Leonard is a native of Flushing, L. I., the date of his birth being September 29, 1870.

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The Cable.

The Direct United States Cable Company (Limited) declared an interim dividend of 4s. per share, being at the rate of four per cent. per annum for the quarter ended December 31, 1907, and set aside £5,000 ($25,000) to reserve, carrying forward about £6,396 ($31,980).

The Commercial Cable Company's steamer Mackay-Bennett was in New York Harbor recently after effecting cable repairs thirty miles off shore. Owing to the continued illness of Captain Ernest G Schenck, her former chief officer, Captain F. H. Larnder has been appointed to command the vessel. Captain Larnder was formerly first officer of the cable steamer Restorer, of the Commercial Pacific Cable Company, stationed at Honolulu. He has had extensive experience in cable repairing.

Cable communication was interrupted February 10 with:

Venezuela — Jan. 12, 1906.
Hayti — Jan. 18, 1908.
All offices closed to International traffic except Cape Hayti, Mole St. Nicholas and Port au Price.
Ahvaz, Persia — Jan. 26, 1908.
Messages must be addressed "Ahvaz, Post Bushire," until further notice.
Madura Island (Dutch East Indies) Feb. 3, 1908.
Demerara — Feb. 3. 1908.

The fourteenth annual dinner of the cable companies in London took place at the Florence, Rupert street, W. One hundred and forty diners sat down under the chairmanship of T. Bullock, of the Eastern Telegraph Company, who was supported by J. C. Denison-Pender and Mr. Youngson, of the same company; E. G. Phillips, of the Commercial; H. H. Allingham and G. Crighton, of the Western Union; Mr. Preddell and N. A. Boex, of the Direct Spanish, and numerous others. The programme of entertainment which followed the dinner, embraced several speeches, instrumental and vocal music and numerous recitations by members of the cable fraternity.

The cable steamer Relay, belonging to the Mexican Telegraph Company, formerly the prop- of the Central and South American Telegraph Company, arrived at New York on January 28. She left Callao, Peru, December 7, 1907, passing through the Straits of Magellan, subsequently calling at Montevideo and Barbados for coal. The steamer had a rough voyage, but reached New York in good condition, all on board being well. The Relay is to take the place of the Mexican company's cable steamer Mexican, which is considered too small for the work that may be necessary on the New York-Colon cable and the Mexican Gulf cables. The Central and South American Telegraph Company's steamer Guardian, which was built by Swan-Hunter, of Walker-on-Tyne, at a cost of $300,000, and which arrived at Callao, November 25, 1907, takes the places of the steamer Relay.

The mystery surrounding the fate of Thomas Pain London, familiarly known as "Tom" London, the well-known submarine cable engineer, has at last been definitely solved. As stated in our issue of January 16, he was sent by his company, the Telegraph Construction and Maintenance Company, of England, to Mombasa, on the east coast of Africa, to superintend the laying and repair of cables at that point. He went on a shooting expedition, from which he failed to return. Extended search was made for him, but without avail. It now appears from a despatch received from Mombasa that the body of Mr. London has been found and that certain natives have been arrested for the murder. Believing him to have been murdered, however, notice of his death as occurring on December 19, 1907, published by his family, had previously appeared in the London papers. Mr. London was in New York, where he had many friends, but a short time previous to being ordered to Africa. The steamer Colonia, to which he was attached, laid the cable of the Central and South American Telegraph Company, from New York to Colon, last summer.

Obituary.

Peter N. Uken, an operator of the Western Union Telegraph Company at Kansas City, Mo., died at that place on January 20.

William J. Bradley, aged twenty-nine years, an operator employed by the Postal Telegraph-Cable Company, in New York, died at Saugerties, N. Y., on January 28.

The Railroad.

Mr. G. A. Dornburg, chief lineman of Pennsylvania Lines West of Pittsburg, and Mr. Leroy Behner, identified with the same interests, both of Pittsburg, were recent New York visitors, coming in the interests of the service.

A bill has been introduced in the New York state legislature by Assemblyman Frederick Northrop, of Poughkeepsie, which provides for the creation of a state board of telegraph examiners, to be appointed by the governor, whose duties shall be to examine all applicants for positions as railroad telegraphers, none being permitted to serve unless having a license from the state board.

Municipal Electricians.

A patent, No. 877,067, for an automatic transmitter for fire-alarm and sprinkler systems, has been issued to James Fiddes and John F. Watt, of Aberdeen, Scotland. A fire-alarm and sprinkler system designed to communicate automatically with the fire brigade station or other point and indicate when automatic sprinkler or fire-alarm in a building has been brought into action.

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Former Fire Commissioner Lantry, of New York, applied for an appropriation for the purpose of replacing the old electrical equipment with entirely new wires, new alarms, new instruments and, finally, a new fireproof building for the headquarters. About $2,500,000 will be required. The New York Board of Fire Underwriters first called the attention of the department to the conditions when Nicholas J. Hayes was commissioner. Commissioner Hayes saw the conditions were dangerous, and so reported to the mayor. This was in September, 1905, but no actual steps were taken for the improvement of matters until John H. O'Brien obtained, when he was fire commissioner, an appropriation of $25,000 for the preparation of plans and specifications for a new system. These plans were submitted to the engineers of the Board of Estimate and Apportionment and of the Department of Finance on their completion in September, 1907, and were approved. Commissioner Lantry was to ask for an appropriation, but unless the temper of those who control the municipal pursestrings changes there will be difficulty, as Chief Croker testified before the Commissioners of Accounts that the cost of the new system would be at least $2,500,000. Chief Croker said on the stand that the new alarm system was almost as necessary as an immediate supply of good hose. Messrs. J. J. Carty and K. B. Miller have given technical evidence as to the sad condition of the electrical system.

Superintendent Jesse Hargrave, of the Postal Telegraph-Cable Company, as an Author.

Jesse Hargrave, until lately assistant electrical engineer of the Postal Telegraph-Cable Company, New York, and now one of its superintendents, recently essayed the role of author with distinct success. To the new and revised edition of "Electrical Instruments and Testing," by Norman H. Schneider, just out, which treats of the use of the voltmeter, ammeter, galvanometer, potentiometer, ohmmeter, the Wheatstone bridge and the standard portable testing sets, Mr. Hargrave has contributed important matter which appears in the two concluding chapters, one treating on testing telegraph wires and cables, the other in locating faults in telegraph and telephone wires and cables, in which valuable tables are given. This matter in detail may be summed up under the following heads: Early morning tests; wrecks; locating grounds by Wheatstone bridge measurements; measurement for crosses using Varley test; measurement for crosses using the two cross wires only; locating a cross by voltmeter test; insulation tests by milliammeter method; insulation tests by voltmeter method; conductivity tests; location of grounds and crosses by Varley method using multiplied arm ratios; how to find trouble after located; Varley test; Murray test; locating openings in cable conductors by bridge method; resistance measurement; fault location; to locate openings using buzzer and telephone. Mr. Hargrave's treatment of his subject has been especially well considered and embodies the best thought of this well-known telegraph authority who has devoted all the years of his business life to the telegraph service. Mr. Hargrave's experience in the class of tests he describes, respecting which telegraph people desire specific information, well qualifies him to prepare the descriptive matter he has so carefully done in this volume. There is, in fact, no other book that treats so comprehensively and with so much elaboration of detail the subjects he discusses. Mr. Hargrave's knowledge of the requirements necessary to fit a man for responsible service in telegraph employ has prompted him to furnish all necessary information to meet any probable emergency that is likely to arise in wire and cable testing.

The volume embraces 256 pages, has 133 illustrations and diagrams. Price, cloth, $1; in full limp leather, $2. Address all orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

The Railroaders' and Telegraphers' Aid Society of Cleveland.

In a little brochure just at hand the proceedings of the twenty-second annual meeting of the Railroaders' and Telegraphers' Aid Society, of Cleveland, O., held on December 9, 1907, are fully set forth. The reports of the secretary and of the treasurer show that while the membership had fallen off somewhat during the year just closed, the finances of the association are in excellent shape. There are now 160 members, and a cash balance on hand of $1,374.08. The officers of this society are: T. S. Bradley, president; F. E. Rudenauer, first vice-president; George K. Ingersoll, second vice-president; N. G. Underwood, secretary, and John H. Cox, treasurer. The executive committee is made up as follows: Paul C. Hamel, J. T. Williams, Isaac Morris, A. J. Freeh, A. J. Black, J. P. Mullen.

The telegraph system of the Dutch East Indies in 1905 comprised 14,147 kilometers of line and 19,179 of wire, the latter being composed of 13,858 of aerial wire, 5,221 of submarine and 99 kilometers of underground wire. In 1905 there were 586 offices, an increase of eleven over the previous year five hundred were owned by the government; fifty-six by railways and thirty by private undertakings.

The telegraph system of Indo-China owned a total mileage of wire of 27,129 kilometers on October, 1906, this being an improvement of 1,872 kilometers on the previous year; one hundred and fifty-nine kilometers of lines in Tonkin were transferred from wooden to iron poles, and there are now 2,021 kilometers of wire on iron and 1,529 kilometers on wooden poles. Cochin China's totals are 2,164 and 503; Gamboge, 821 and 1,519; Annam, 934 and 197, respectively, while Laos owns 2,030 kilometers on wooden poles only. The total mileage of line on October 1, 1906, was therefore 11,619.

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Ask Delay in Telegraph Law.

Delegations of railroad officials recently appealed to the President to use his influence to defer, and afterwards asked the House Committee on Interstate and Foreign Commerce to so amend, the hours of service law as to permit the Interstate Commerce Commission to make exceptions in the time of the beginning of the enforcement of the telegraph nine-hour law. A lack of a sufficient number of telegraph operators, the officials explained, will make it impossible to enforce the law, which becomes operative on March 4. The President stated that he was without jurisdiction, and the House Committee has taken no action on the matter. In the meantime the railroad telegraphers, acting in accordance with official request of the Order of Railroad Telegraphers, are importuning Congress not to grant the petition of the railroads. H. B. Perham, president of the order, who is watching events at Washington, declared in contradistinction to the statement of the railroad men, that there are 15,000 operators idle in the country.

The "Twentieth Century Manual of Railway Station Service," by Frederick L. Meyer, author of the "Twentieth Century Manual of Railway and Commercial Telegraphy," treats its subject matter with the same clear perceptions of what is needed by those who wish to become station, freight, ticket and baggage agents, such as distinguishes the latter work in discussing the question of telegraphy in its application to both commercial and railway needs. The telegraph operator who also fills the position of station agent, will find in this book an unusual amount of information not otherwise readily available. It contains a great number of blank forms, covering all phases of the business, general laws, classification of freights, and special methods, all of which are helpful to the agent, it being the kind of enlightenment he requires. The subject of the telegraph is not treated in this work, but the book, together with the volume by the same author devoted to telegraphy, constitutes a source of direction and aid of pronounced value, which the railway telegrapher and station agent seeking knowledge, will find it advantageous to possess. Particularly is this true at this time, when many thousands of commercial telegraphers will doubtless seek to avail themselves of the opportunities afforded by the railroads for employment this coming season. Many commercial men need only a little training in respect to freight, passenger, baggage and express accounts to fit them for the railroad service, and this volume explains very fully what they are required to understand concerning these duties. The book is bound in cloth and embraces 216 pages; price $1.25, on receipt of which it will be sent to any address in the United States, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Mr. Good Retires as Agent of Telegraph Age at Philadelphia.

Mr. D. Good, of the Western Union Telegraph Company, Philadelphia, who has been succeeded at that office as agent of Telegraph Age by I. D. Maize, faithfully and with pronounced success served the interests of this journal continuously for nearly fifteen years. During that long period Mr. Good not only secured many subscribers for this journal within the city of Philadelphia, the state of Pennsylvania and a half dozen other states as well, a list which he was also constantly enlarging, but was equally successful in retaining these subscriptions. In a letter explaining why he was obliged to retire from the agency, Mr. Good says: "In all these years I found the pages of Telegraph Age clean and filled with interesting matter both to the professional and to the layman, and always fair in its dealings toward the company and the men. It is a journal which the profession may well be proud of. * * * My relations with it have been of the most cordial character, and it was with regret that I severed my connection. I cherish nothing but the most kindly feelings for it, and wil labor for its success, using my influence in its behalf, just the same as I always have done."

A correspondent who expresses interest in the very full and comprehensive list of telegraphic code characters of the Morse, Continental and Phillips systems, printed in Telegraph Age in its issue of February 1, notes that differences in several particulars are observable therein as compared with those occasionally appearing elsewhere. We welcome the communication, for it indicates that the very purpose we had in view is being accomplished, namely, to direct attention to the evident need that exists of correcting errors that have been made in defining telegraphic characters that carelessly have been allowed to creep into some of the current books treating on telegraphy. The list as published by Telegraph Age is correct, and may be confidently accepted as being strictly accurate. It might be advantageous to many to cut out the page in question and preserve it for reference. Its value in this respect is apparent.

Senator La Follette, of Wisconsin, has introduced at Washington a bill to regulate the interstate transmission of telegrams. He believes that the interstate business of telegraph companies should be under the Interstate Commerce Commission, as interstate railroad rates are regulated. The bill also prohibits government employees from accepting telegraph franks.

Orders have been received at Mare Island, California, for the installation of a wireless telegraph outfit aboard the hospital ship Relief.

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Representative Canadian Telegraphers.

EDWIN POPE.

Edwin Pope, superintendent of the Eastern division of the Great North Western Telegraph Company, at Quebec, has been identified with the telegraph in Canada since an early period of its history. He was born at Kingston, Ont., his education being acquired at Quebec, at which point he entered the service of the Montreal Telegraph Company in 1855. At this time but one

EDWIN POPE,
Superintendent Great North Western Telegraph Company, Quebec, Que.

wire was worked from the office, connecting Quebec with Montreal, and the paper register was in use. Mr. Pope's advancement was rapid and he was soon acting in the triplicate capacity of cashier, bookkeeper and operator. In 1862, Orrin S. Wood, the general superintendent of the company, nominated Mr. Pope to the charge of the office at Buffalo, N. Y., but while on his way to that point he was detained at Toronto by Superintendent H. P. Dwight. The result was that he remained at the latter place for a year, when he was appointed superintendent of the Northern New York division of the company, with headquarters at Watertown, N. Y. Here he did good work in extending the lines of the company through that section. One of these extensions was carried up the valley of the Black River, and connected with a line of the Western Union company from Utica. In order to make arrangements for the working of this line Mr. Pope was asked to visit Rochester, N. Y., then the headquarters of the Western Union Telegraph Company. This visit resulted in his being appointed a superintendent of that company, a position he held in conjunction with that in the foreign corporation. At this time Colonel Anson Stager of the Western Union, proposed to Mr. Pope an exchange of the Western Union lines in New Brunswick and Nova Scotia for those of the Montreal company's in New York state, but the offer was not entertained at the head office in Montreal, the governing reason being that the success of the Atlantic cable was still problematical, while under the reciprocity treaty, then in force, there was a much larger business between Canada and New York state than between Canada and the Lower Provinces. The decision may have been wise for the moment, but an opportunity to round off their territory was lost by the Montreal company. In 1866 Mr. Pope was moved to Quebec and placed in charge of the Eastern division of the company's lines and has been continuously in charge there ever since. He has served the Montreal company and its successor, the Great North Western Company, for over fifty-two years, forty-four years as superintendent.

Two years ago the company, in further recognition of Mr. Pope's abilities and long service, extended his district so that now he has charge practically of the Province of Quebec and of the company's lines in New Brunswick, Maine, Vermont and New Hampshire.

Mr. Pope is the patentee of several telephone improvements which have been acquired by the Bell Telephone Company. He is also the inventor of an ingenious printing telegraph system.

The New Treasurer of the Gamewell Fire-Alarm Telegraph Company.

Watson W. Bowes, the new treasurer of the Gamewell Fire-Alarm Telegraph Company, 19 Barclay street, New York, who succeeds to that office the late Harry F. Bender, deceased November 6, 1907, is a Nova Scotian, and was born August 1, 1861. He received a common school education and entered the Bank of Nova Scotia

WATSON W. BOWES,
Treasurer Gamewell Fire-Alarm Telegraph Company, New York.

at Halifax as a clerk. Afterward he was promoted to the position of teller at their agency, Chatham, New Brunswick. Later he entered the service of the Bradstreet Mercantile Agency as superintendent of their Denver, Colo., office. For the past eighteen years Mr. Bowes has been connected with the Gamewell Fire-Alarm Telegraph Company in different positions, including that of assistant treasurer at their factory, Newton Up-

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per Falls, Mass., and his present appointment is due entirely to merit. Mr. Bowes brings to his latest position the excellent qualities of experience and capability, combined with an attractive personality.

Western Union Improvements.

The expenditures for additions and improvements to the Western Union Telegraph Company property during the last seven years have amounted to $26,561.768 has been. This expense met in part from the proceeds of bond sales and partly from net earnings. The amounts expended for improving the property, such as the construction of new lines and wires and for the payment for stock and interest in other companies, from July 1, 1900, to September 30, 1907, were as follows:

Construction	$18,242,192
Stocks and properties purchased	7,947,984
Patents	208,000
Real Estate	163,592
Total	$26,561.768

The results of part of this expenditure can be seen from the following table, showing the miles of cables and poles, miles of wire placed, and the offices established in the last seven years:

	Miles of Poles & Cables.	Miles of Wire.	Offices.
1907	205,646	1,321,199	24,760
1906	202,959	1,256,147	24,323
1905	200,224	1,184,557	23,814
1904	199,350	1,155,405	23,458
1903	196,517	1,089,212	23,120
1902	196,115	1,029,084	23,567
1901	193,589	972,766	23,238

During these years the mileage of the poles and cables increased over 12,000 miles, wire mileage increased 348,433 miles, and there were established 1,522 additional offices.

Purity of Rubber as an Insulating Compound.

Probably no form of insulating material for wires has been so frequently discussed as india rubber and its component ingredients, known commercially as "rubber," according to Henry W. Fisher. Very many tests have been devised to determine the percentage of rubber and other materials, and especially the amount of fine para.

In a compound containing both pure para and other grades of rubber, it will probably never be possible to tell the relative percentages of each. If the amount of inferior grades of rubber is considerable, an indication of the fact can be obtained from some of the various tests now used.

Specifications have been devised with a view to securing, by the application of certain well defined tests, an absolutely certain percentage of pure para. In some of these cases the manufacturer could have furnished a better compound containing wax or similar solid hydrocarbons mixed with the dry mineral filler, but the presence of such materials would make it impossible to tell how much of the rubber was fine para.

In view of these rather complicated conditions, several of the manufacturers of rubber-covered wire framed a set of specifications which would ensure thirty per cent. para and give at the same time latitude to the manufacturer to use such other ingredients as in his experience would make a compound having toughness, elasticity, resistance against high voltages, and other desirable qualities.

The Wireless Telegraph of the Togo Negroes.

A German colonial official writing from German East Africa says: "During a journey in Togo I noticed particular bell-like tones coming from a distance. I asked my 'boy' what that meant. He said that it was the 'ehu,' a remarkable instrument consisting of two wrought-iron cow-bells, one large, the other small, which are welded to a common handle and struck with a stick. According as the tones are at shorter or longer intervals apart, words and sentences are formed, and these are thus conveyed from village to village. Almost every native in the party seemed to understand the ehu language. As the sounds were sent out far into the distance, the boy said smilingly: 'Sir, that is about you; the ehu has said: "The white man comes. He has no soldiers. He is going to Woga."'"

It is, however, questionable whether the instrument conveys words and sentences as such; for this would imply a written language. It could, however, be used to convey ideas, just as does one form of the deaf and dumb sign language.

Carnegie Institute Studies.

The marine observations in the Pacific Ocean, conducted by the Carnegie Institute, of Washington, during the last year, lead the officials to believe they can save the great ocean liners from $1,000 to $2,000 on each voyage. According to the year-book of the institution, just issued, measurements of magnetic declination, dip and intensity were made, and a new magnetic chart, correcting errors in former charts, has been made, and mariners, it is said, will now be able to steer much straighter courses. The Galilee, the vessel employed in the survey, according to the year-book, has traversed over 50,000 miles along courses where few magnetic observations have been previously made.

"Modern Practice of the Electric Telegraph" maintains its value as an excellent technical handbook for electricians, for telegraph managers and for operators. The fact that numerous editions of the book have been issued proclaims its intrinsic worth. The author, the late Franklin Leonard Pope, was a former president of the American Institute of Electrical Engineers, a member of the Institution of Electrical Engineers of London, an old-time telegrapher, and a writer of marked ability. The volume embraces 234 pages, has 185 illustrations and is fully indexed. Price, $1.50, postpaid. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

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Important Subjects Treated in Back Numbers.

TELEGRAPH AGE has published the best articles on telegraphic subjects that have ever appeared in print. Herewith are enumerated a few of the most important subjects treated, together with the date of the papers containing the same. Copies of these back numbers may be had at twenty-five cents apiece upon application. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Adjustment of Relays and Sounders ..... Oct. 1, 1902
Alternating Current Transformer for Quadruplex, W. H. Jones ..... Mch. 1-16, 1904
American Cable Across the Pacific ..... July 16, 1903
Alaskan Telegraphs ..... Jan. 1-16, Feb. 1, 1905
Atmosphere and Earth Electrical Conditions, E. C. Walker, Dec. 16, 1904
Barclay Combination Quadruplex Rheostat ..... July 1, 1903
Barclay's Direct Repeating Relay for Multiplex Circuits, July 16, 1902
Barclay Printing Telegraph System, W. H. Jones ..... May 16, 1905
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C. K. Jones' Automatic Telegraph Circuit Protector and Signaling Machine ..... June 16, 1903
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Use of Modern Telephone as Applied to Railroads ..... Jan. 16, 1905
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What Constitutes a First-Class Chief Operator ..... Nov. 1, 1904
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Magini, Improvements for Practical Telegraphy ..... Sep. 16, 1906
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Wire, Hard Drawn Copper, History of, Thos. B. Doolittle ..... Jan. 1-16, 1906
Wheatstone Bridge, F. W. Jones ..... Nov. 16, 1906
Wright Keyboard Transmitter and Printer, R. Hitchcock .. Apl. 1, 1906

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26, 1908.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Railway Signal Association will meet in 1908 at a date and place to be named later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., in 1908, at a date to be named later.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers' Association meets at Fort Worth, Tex., on June 18, 1908.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

The influx of new men in the telegraph service has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is $1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

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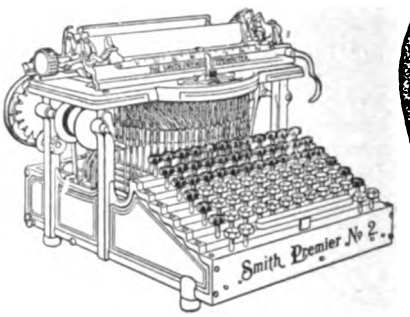

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NEW YORK, FEBRUARY 16, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Important Supreme Court Decisions.

The Supreme Court of the United States has recently delivered three opinions construing laws adversely to the contentions of organized labor. The first decision was rendered on January 6 in the case of some railroad employees who sought damages under the employers' liability law, making railroads responsible for injuries resulting from the negligence of fellow servants. This law the court held to be unconstitutional. The second decision was announced on January 23, when the Erdman arbitration act, forbidding the discharge of employees because they are members of labor unions, was declared invalid. This decision is published in part on another page. The third decision was delivered on February 3, and involved the applicability of the Sherman anti-trust law to boycotting conspiracies by labor unions.

These decisions are highly important, and are all the more significant coming, as they have done, in rapid succession, inasmuch as they determine definitely hitherto complex conditions in industrial relations, and give power, direction and clarity to thought and understanding in regard to the same.

The Effect of the Nine-Hour Law on the Railroad Telegrapher.

The bill passed by Congress providing a nine-hour law for all railroad telegraphers, and which becomes operative on March 4, while enacted ostensibly in behalf of telegraphers, many of whom were advocates of the measure, appears likely to prove a boomerang in its operation. For, apart from what may be deemed the ethics of the case, nice points not always admitting of a practical interpretation, and anyway which are not now under consideration, the facts are that while the burden inflicted by the situation bears heavily on the railroads themselves, the telegrapher as an individual at many points will also come in for his share of hardship rather than betterment. This, it would appear, is an unexpected and must be a disappointing outcome of the agitation resulting in legislation curtailing the hours of railroad telegraphic labor to eight and nine-hour daily periods by state and nation, respectively.

At many of the smaller country stations, where but a single person is employed as agent and joint railroad and commercial operator, the effect of the new law will be to cause the closing of such stations because the employment of two or more men at these points is not warranted by the narrow amount of business handled.

The railroads cannot be blamed for discontinuing such service in the smaller offices and it need not be surprising if they find that they can install a telephonic service which will practically eliminate the telegrapher. No one can blame the telegraphers for desiring shorter hours, as the hours of work in many instances have been undeniably long. The hand of almost every man has been against the public service corporation during the past few years and the end is not yet. It is well that a halt should be called upon the interference of legislation with the affairs of the public and semi-public corporations. The result will be shown in reduced earnings for stockholders and in badly crippled service for patrons, both of which are to be deplored.

Lack of Efficiency in the Telegraph Service.

Old time operators who manifest pride in their occupation, and who have been accustomed to bring to the performance of their duties the spontaneous free will effort and conscientious desire to meet required service, frequently lament over the want of efficiency too often exhibited on the part of the modern operator. It is a common remark on the part of the elders in referring to their present day successors, that the gentlemanship of deportment, keenness of observation, good judgment and the exercise of practical common sense necessary to the successful handling of public

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messages, is measurably lacking as compared with the period of, say, twenty-five years and more ago. And the question is asked, Why is this so? It would not be fair nor would it be true to arraign the entire brotherhood of telegraphers and declare their inferiority to those of a previous generation. That, of course, would be a libel on the intelligence and high character of large numbers of men who are faithfully serving the telegraph in their day and generation. And yet, the old timer notices a difference in the personnel taken as a whole, even if he is unable to exactly define it, and comments upon the circumstance, almost sadly at times. In the endeavor to arrive at a solution of the matter, he is moved to ask whether operators are as well educated as formerly; whether their school training has been sufficient, or, for that matter, their early home training; or whether it is because the advancement of the messenger boy, not of the old-fashioned type but of the more modern genus, to a place at the key, has introduced into the service material which it were better had been excluded. Whatever the reason, the old timer, himself of skilful attainments, honest, of sobriety of manner and truth of statement; with elevating domestic attachments and with a reverence for and devotion to the telegraph, his long time connection with which, appealing to his self-respect, is troubled with the outlook in the field in which he has so long held an honorable place, and when he appeals to Telegraph Age with mind disturbed, he engages at once an attentive and sympathetic listener.

The telegraph service of to-day offers to the intelligent and progressive operator who will embrace all of the advantages his position offers him, better prospects for attaining success in life than were held out, or were possible, to the old time operator. This is true because the opportunities afforded the individual, whether he remain in the service or determines to make use of it simply as a school of preparation for other work, are more numerous and better to be desired than previously existed. At the same time, much as we regret to say it, it is true that there are fewer men in the service, comparatively speaking, who are doing really good work and seeking future success, than was formerly the case. The strength of this statement may be modified somewhat when the improvement noticed in the late rearrangement of personnel is considered; but in a general way the remark will stand.

Character will always make its impress; it is character that impels the individual to study and application; it is the influence of character that finally enables one to reach the higher places in this world's achievements. Very much of the work performed to-day in large telegraph offices is of an indifferent quality. Pride in working the wire has evidently vanished from the threshold of many offices. Twenty-five years ago the operator having charge of an important circuit did his utmost to keep business moving smoothly without error, and in a manner that reflected creditably on the individual as a man of experience and good judgment. It is the exception, perhaps, where this is now true. The operator of to-day possesses the advantage of a typewriter wherewith to produce fine looking copy and with much less effort than was necessary in using the pen, yet how few there are who fashion a typewriter message that would do credit to a schoolboy. In a large office we have in mind the manager noting the slovenly prepared copy turned out by his force sought to remedy the matter. It was a mortification to him. He appointed a member of the staff whose duty it was to inspect and point out deficiencies in this respect and endeavor to correct the abuse. The inspection showed that not an operator in the entire force of several hundred employed but what was incapable of or indifferent to the production of proper copy. Such a state of affairs was disgraceful. It is typical, however, of many offices.

It may be said that the turning out of either a well written or of a poorly prepared message is a comparatively small thing. Not so: it is indicative of the mind that governs the action. It is frequently the little things of life that serve as an index of the larger and more complex nature of our being. It is not alone in the use of the typewriter that operators should seek improvement, but in all the work that pertains to a correct understanding of the telegraph they should acquire knowledge. This is their avocation and they owe it to themselves, to their sense of manhood responsibility, to employing interests, to arouse enthusiasm and to stimulate and improve their own minds to greater deeds and nobler purposes. If a man wants to be a groveler all his life that is his privilege, but if he desires place and emolument let him prepare for it by hard work following intelligent lines of application.

The Value of Wireless Telegraphy on the Ocean.

The importance of the uses of wireless telegraphy received forcible illustration a few days ago when by its means information of a wreck at sea was transmitted to land, permitting timely assistance to be sent to the disabled vessel. It was the case of the schooner Mary L. Newhall, of Bath, Me., which was being swept by seas two hundred miles north of Bermuda. The steamship Bermudian, which was standing by, but which had been unable to affect a rescue of the crew because of the gale, reported the plight of the vessel to Fire Island by wireless. The message said that the schooner's sails had been carried away and that boats which had been sent away to aid, were unable to reach her.

Another instance of the value of wireless telegraphy was afforded in the case of the recent burning of the steamship St. Cuthbert at sea, two hundred miles off the coast of Cape Sable, N. S. The news of the disaster, with the information of the loss of a portion of the crew and the rescue of

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the survivors, was transmitted by wireless from the rescuing steamer, Cymric, of the White Star Line, and was received several days prior to the latter's arrival at port. While the steamer was actually being destroyed by fire, the news of the burning was being read throughout the world.

The Nine-Hour Railroad Law.

The Interstate Commerce Commission has been deluged with letters and telegrams protesting against the proposal of the railroads that the commission suspend the enforcement of the law providing that railroad telegraphers shall not be permitted to work more than nine hours a day. In two days 1,759 such protests were received by the commission in the form of telegrams. They came from telegraphers employed by the railroads and from union labor leaders. The law in question will become effective March 4. While the commission has made no formal ruling on the application of the railroads that an extension shall be allowed, it is understood that the members of the commission are of the opinion that they have no discretion but to begin enforcing the law on the date named.

The Railroad Gazette, in the course of a recent editorial in referring to the railroad situation, had this to say:

"The railroad, hard pressed to pay moderate dividends, perhaps even to pay fixed charges, tries to retrench. But public sentiment resists the privilege which it concedes to the private corporation. The big factory may close and discharge its thousand hands and there is no public note save one of passing regret. But let the railroad take off a single unprofitable train and public outcry rises. Certain fundamental rights of private capital are denied to the quasi-public capital invested in the railroad."

Press Telegrams in England.

"The history of the English Postal telegraph service is a long record of mismanagement by unsympathetic Postal officials," says the Telegraph Chronicle, of London, "who resented the decision of the government of the day to acquire the telegraphs, and who by their inept conduct at the time of the transfer and maladministration since, have failed to develop the electric telegraphs as they should have done. The worst illustration of the consistent blunderings of men who were ignorant of the possibilities of the esteem, and indifferent to the needs of the community is to be found in the manner in which the press telegrams have been managed. The climax has been reached by a departmental committee practically advising the postmaster-general to abandon the rights of the state, bought by a huge sum of public money, to hold the telegraphs as a government monopoly."

The Telegraph Chronicle follows up this introductory of the subject by a severe arraignment of the postal service in which a long array of authoritative facts and figures and testimony of those prominently interested therein are given, and concludes with the following summing up of the case, which affords suggestive information for those who are clamoring for governmental ownership of the telegraph in this country:

(a) Post Office administrators made a bad bargain for the public when the original press tariff was agreed upon, if revenue was the sole object of consideration.

(b) Instead of admitting (1) that the telegraphs existed for public need, irrespective of revenue or (2) increasing the tariff, the Post Office adopted two methods of dealing with press messages.

(c) Deliberately delaying press messages on public wires in order to diminish the quantity.

(d) Renting private wires to big financial concerns, squeezing out small capitalists, and breaking the Act of Parliament of 1868.

Mr. Buxton, on the advice of incompetent officials, now proposes to:

1. Hand over the public powers to newspaper proprietors, thereby giving away the monopoly of the transmission of telegrams secured by Act of Parliament to the state, and in defiance of the opinions of Mr. Fawcett and Lord Eversley.

2. Suggesting sub-contracting and the recruitment of telegraph operators without inquiry into their pay or conditions of service.

We charge the Post Office officials with a great breach of public trust. We charge them with having deliberately tried to force down the wages of state telegraphers (vide 1894 departmental report and 1902 report dual workers), and failing that, suggesting to outside capitalists that outside operators should be obtained.

The position is a serious one. The Post Office officials blundered during the telephone arrangements, but on the present occasion they have made themselves subservient to the demands of the wealthy newspapers of this country, and it is imperative that Parliament should demand a complete investigation into this ugly business.

Telegraphic Brevity.

Some recent notes from Europe remark that the word "Eisenbahnbetriebstelegrapheninspektionassistenten" would suggest German humor were it not recognized in the census of all the professions, trades and occupations which were covered in the German Empire in June last. The calling in question is that of assistant inspector in the railway telegraph service, and is one of 15,016 different occupations specialized by the census taken in that month.—Electrical World.

President Roosevelt in his recent message urges legislation to curb bucket-shop operations on exchange by forbidding the use of the mails, telegraph and telephone wires, as is done now in lottery transactions.

It is astonishing how many wireless telegraph stations there are in these days which report having picked up wireless messages from stations located at points distant anywhere from 2,000 to 12,000 miles. We may soon expect to hear that someone has reached Mars by wireless communication.

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George Gray Ward on the Proposed Change of the Telegraph Alphabet.

In a recent interview with George Gray Ward, vice-president and general manager of the Commercial Cable Company, with a representative of Telegraph Age, on the question of proposed changes in the American form of the telegraph alphabet, he stated that he thought it a mistake to consider any change in the American alphabet unless the Continental code was substituted therefor.

He said: "The latter system is used exclusively all over the world except by the landline companies in the United States and Canada. The adoption of a universal alphabet is much to be desired, inasmuch as it would establish uniformity of action and purpose and promote mutual helpfulness and convenience. All the cable companies in this country use this continental alphabet and so work in harmony with the European governments, administrations and companies.

"Many operators are able to work both codes with equal facility, sometimes changing from one circuit, on which they were working Continental code, to another on which they work American Morse. This shows that there is no difficulty for the American Morse operator to adapt himself to the Continental code.

"In discussing the question of the difference of speed between the Continental and the American Morse signals with the late Lord Kelvin, during a visit of the latter to this country some years ago, he stated that he could mathematically prove that the Continental code was quite as fast and much safer than the American Morse. Those who have worked both codes must realize this, especially in transmitting the difficult cipher cable messages which makes it unsafe to send American Morse signals at a high rate of speed.

"The American navy has recently adopted the use of the Continental code in connection with wireless telegraph on board their war vessels, and should Congress confirm the Wireless International Treaty all wireless systems will have to employ a universal code, which will undoubtedly be the Continental.

"The spaced and long dash letters prevent the American Morse being used on long submarine cables.

"It is difficult to make comparison from actual traffic of the relative speeds and liability to error of these codes. The electrical condition of the line and capability of operators and class of traffic must all be taken into consideration, but instances are known where lines worked so sluggishly as to make it practically impossible to distinguish the spaced and long and short dash letters of the American Morse alphabet, while the Continental code was read without much difficulty.

"A logical view of this subject must show that the Continental code dealing in only dots and dashes is not so exposed to error as the American Morse, which deals in dots, long dashes, short dashes and spaces, but in any case, many errors occur by reason of the split and long and short dash letters, which would be eliminated by the adoption of the Continental code. I have often discussed this question with telegraph officials and have yet to find one who does not favor the introduction of the Continental code."

The International Telegraph Conference.

The International Telegraph Conference, which was to have opened at Lisbon, Portugal, on April 4, has been postponed until May, at a date to be yet announced, owing to the assassination of the Portuguese king. The king had issued invitations to the various governments, tendering the hospitality of that country to the delegates. Among those who will represent American telegraph interests are George Gray Ward, of New York, vice-president and general manager of the Commercial Cable Company; General James Allen, of Washington, D. C., chief signal officer, United States Army, and T. W. Goulding, of London, England, the European general manager of the Western Union Telegraph Company.

At an international telegraph convention held at at Brussels in 1858, was laid the foundation upon which has since been built up the present existing system of holding international telegraph conferences. The succeeding convention met at Paris in 1865, when more definite arrangements were perfected for the holding of periodical conferences in various European capitals.

The International Telegraph Convention prescribes, among other things, for the priority of government and service telegrams; the strict secrecy of messages, their prompt despatch and delivery, and the regulation of accounts between the contracting parties. But the states adhering to the convention do not accept any responsibility on account of the service of international telegraphy, and reserve the right "to stop the transmission of any private telegram which may appear dangerous to the security of the state, or which may be contrary to the laws of the country, or to public order or decency." Each adhering government also has the power to suspend its telegraphic service "for an indefinite period, if it judges necessary, either generally or only upon certain lines for certain classes of correspondence," the sole condition being that notice shall be given to the other contracting states in order to facilitate the proper working of the convention. Any state can adhere to the convention on request. Also any state may renounce its adhesion. The convention remains in force indefinitely, or for a period of one year from the date of its denunciation by any state, its general renunciation by the contracting states.

A full history of the International Convention was published in Telegraph Age in the issue of October 16, 1907.

A despatch from Peking announces that China has appointed delegates to represent her, for the

Erdman Law Declared Unconstitutional.

[It has been dicided by the United States Supreme Court that an act of Congress known as the Erdman Law, passed June 1, 1898, is unconstitutional and "an arbitrary interference with the liberty of contract which no government can legally justify in a free land." This decision is of importance to telegraphers, inasmuch as the Order of Railroad Telegraphers is also engaged in testing the constitutionality of the act growing out of the discharge of operators on the Louisville and Nashville Railroad, because of their membership in the order.]

The tenth section of the Erdman law, enacted by Congress in 1898, forbidding railroads or other carriers engaged in interstate commerce to discriminate against or discharge employees because of their membership in labor organizations, has been declared by the Supreme Court to be void as contravening the Constitution. The decision is one of the most important announcements ever delivered by the court on the rights of employers and employees and the principles laid down are far-reaching in their effect on present-day labor conditions, says American Industries.

The decision was rendered on a test case brought by the Louisville and Nashville Railroad. William Adair, master mechanic of the road, for the purpose of attacking the law, discharged O. B. Coppage, a fireman in the employ of the company, because he belonged to the Order of Locomotive Firemen. That organization took the matter up. Adair was indicted under the Erdman law, and convicted and fined $100 by the Federal Court in Eastern Kentucky, which upheld the constitutionality of the act. Carriers and their employees, the court held, being adjuncts of interstate commerce, the law was a proper regulation thereof, and it denied the pleas of the company that it was void because it interfered with the liberty of contract and was class legislation, which were the principal grounds upon which the appeal to the Supreme Court were prosecuted.

The opinion of the United States Supreme Court was delivered by Justice Harlan, who said in part:

"The first inquiry is whether that part of the Tenth Section of the Act of 1898, upon which the first count of the indictment was based, is repugnant to the Fifth Amendment of the Constitution declaring that no person shall be deprived of liberty or property without due process of law. In our opinion that section, in the particular mentioned, is an invasion of the personal liberty as well as the right of property guaranteed by that amendment.

"As agent of the railroad company and as such having control of the business of one of its departments, it was the defendant Adair's right—and that right inhered in his personal liberty, and was also a right to property—to serve his employer as best he could, so long as he did nothing that was reasonably forbidden by law as injurious to the public interests. It was the right of the defendant to prescribe the terms upon which the services of Coppage would be accepted, and it was the right of Coppage to become or not, as he chose, an employee of the railroad company upon the terms offered to him.

"While, as already suggested, the rights of liberty and property guaranteed by the Constitution to every person within the jurisdiction of the United States against deprivation without due process of law, are subject to such reasonable restraints as the common good or the general welfare may require, it is not within the functions of government—at least in the absence of contract between the parties—to compel any person in the course of his business and against his will to accept or retain the personal services of another, or to compel any person against his will to perform personal services for another.

"The right of a person to sell his labor upon such terms as he deems proper is, in its essence, the same as the right of the purchaser of labor to prescribe the conditions upon which he will accept such labor from the person offering to sell it. So the right of the employe to quit the service of the employer, for whatever reason, is the same as the right of the employer, for whatever reason, to dispense with the services of such employee. It was the legal right of the defendant, Adair, however unwise such a course might have been, to discharge Coppage because of his being a member of a labor organization, as it was the legal right of Coppage, if he saw fit to do so, however unwise such a course on his part might have been to quit the services in which he was engaged because the defendant employed those who were not members of some labor organization. In all such particulars the employer and the employee have equality of right, and any legislation that disturbs that equality is an arbitrary interference with the liberty of contract which no government can legally justify in a free land."

"But what possible legal or logical connection is there between an employee's membership in a labor organization and the carrying on of interstate commerce? Such relation to a labor organization cannot have in itself any bearing upon the commerce with which the employee is connected by his labor and services. Labor associations, we assume, are organized for the general purpose of improving or bettering the conditions and conserving the interests of their members as wage-earners, an object entirely legitimate and to be commended rather than condemned. But surely those associations as labor organizations have nothing to do with interstate commerce as such.

"One who engages in the service of a carrier will, it must be assumed, faithfully perform his duty whether he be a member or not a member of a labor organization. His fitness for the position in which he labors and his diligence in the

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discharge of his duties cannot in law or sound reason depend in any degree upon his being or not being a member of a labor organization. It cannot be assumed that his fitness is assured or his diligence increased by such membership, or that he is less fit or less diligent because of his not being a member of such an organization. It is the employee as a man and not as a member of a labor organization who labors in the service of an interstate carrier."

Discussing the relationship of the law to interstate commerce, Justice Harlan said:

"The power to regulate interstate commerce is the power to prescribe rules by which such commerce must be governed. But, manifestly, such rules in order to be within the competency of Congress under its power to regulate commerce among the states must have some real or substantial relation to or connection with the commerce regulated. But what possible legal or logical connection is there between an employee's membership in a labor organization and the carrying on of interstate commerce? Such relation to a labor organization cannot have in itself any bearing upon the commerce with which the employee is connected by his labor and services. * * * Looking alone at the words of the statute for the purpose of ascertaining its scope and effect and determining its validity, we hold that there is no such connection between interstate commerce and membership in a labor organization as to authorize Congress to make it a crime against the United States for an agent of an interstate carrier to discharge an employee because of such membership on his part."

Justice Harlan considered briefly whether the law had its origin in the apprehension of Congress that it did not show enough consideration to members of labor organizations, but he closed that branch of the discussion by saying that he would not indulge in any such conjecture or make it the basis of the decision.

Transmission Line Crossings Over Railroads.

The rapid increase in the number of electric transmission lines and the distributing circuits therefrom, is rendering every day more important and more perplexing the question so frequently encountered as to the protection, if any, which should be provided at railroad crossings.

The fear which the steam railroad operator has in regard to such crossings arises from two sources. He fears the damage which might result through mechanical agencies, in case the transmission line should fall upon the track. He fears, also, the damage which he thinks might result through electrical agencies. The fear of the electric current is usually the greater, probably because of the fact that most steam railroad operators have had little, if any, experience with electricity, and they attach to it more or less of the mysterious dread which people have for it generally.

The protection for which the railroad man generally asks, is a steel bridge constructed underneath the transmission line for that portion of its length which is across the railroad company's right-of-way; or at least for that portion of its length which is across the tracks. In some cases, it has been required that the transmission line be carried on insulators attached to this structure; such a requirement is an undesirable one from every standpoint.

There can be no question that a transmission line can be made as strong as any steel protecting bridge that can be installed, and, in general, strength can be obtained at a great deal less expense than is involved in installation of the bridge. A simple span of wire or cable supported at each side of the right-of-way, on steel structures if necessary, can be made as strong, both as to supporting structures and as to the cables, as any bridge which can be erected. It seems foolish, therefore, to insist upon the installation of a bridge below a transmission line for fear that, through mechanical agencies, the transmission line may be thrown down.

Probably no railroad operator would make special objection to have built across his tracks a construction similar to that of a well designed transmission line, if he knew no current was to be put upon it; but, in some instances, the mere idea of having current on the wires seems to introduce immediately a fear of the construction—both mechanically and electrically. In such cases, the ultimate source of the fear and objection to the transmission line crossings may be said to lie in the fact that the lines carry an electric current; and it is well, therefore, to examine into the possible ways in which the existence of an electric current on the lines may affect the safety of the property or employees of the railroad.—Ralph D. Mershon in the Railroad Gazette.

Annual Dinner of the American Institute of Electrical Engineers.

The annual dinner of the American Institute of Electrical Engineers will be held at the Waldorf-Astoria, New York, on the evening of Wednesday, February 19, at 7 o'clock. Carrying out the idea established upon former occasions, the feature of the dinner this year will be the tribute rendered by the speakers to the relation of the electrical engineer with public service corporations. The occasion will be designated as the "Public Service Dinner," and among the speakers who have promised responses to toasts are many men prominently identified with public service utilities, either as members of commissions or operating heads of large utilities organizations.

The dinner committee is composed of Robert T. Lozier, chairman; A. A. Gray, Frederick C. Bates and George H. Guy.

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The Education of the Electrical Engineer.

Charles P. Steinmetz, consulting engineer of the General Electric Company, Schenectady, N. Y., in an address before the American Institute of Electrical Engineers, New York, on January 24, gave utterance to the following thoughts on the education of the electrical engineer, embodying truths so fundamental in character that they should have the widest possible reading:

When I dwell more on those features of our electrical engineering education which appear to me unsatisfactory, it is not that I overlook the many good points, but rather that a criticism of the few defects appears to me more important, for the purpose of urging their elimination.

The great defect of the engineering college is the insufficient remuneration of the teaching staff; the salaries paid are far below those which the same class of men command in industrial work, and as a result the college cannot compete with the industry for its men, but most of the very best men are out of reach for the colleges. It appears to me that a vast improvement could be made in electrical engineering education if a large part of the sums which are now devoted to marble engineering buildings and fancy laboratory equipments could be devoted to offer such salaries as to make available to the colleges the undivided time and interest of the best men in the field.

To the subjects taught and the methods of teaching very grave objections may be made. The glaring fault of the college curriculum is that quantity and not quality seems to be the object sought; the amount of instruction crowded into a four years' course is far beyond that which even the better kind of student can possibly digest. Memorizing details largely takes the place of understanding principles, with the result that a year after graduation much of the matter which had been taught has passed out of the memory of the student, and even examinations given to the senior class on subjects taught during the freshman and sophomore years, reveal conditions which are startling and rather condemnatory to the present methods of teaching.

It stands to reason that with the limited time at his disposal, it is inadvisable for a student to waste time on anything which he forgets in a year or two; only that which it is necessary to know should be taught, and then it should be taught so that at least the better student understands it so thoroughly as never to forget it. That is to say, far better results would be obtained if half or more of the mass of details which the college now attempts to teach, were dropped; if there were taught only the most important subjects—the fundamental principles and their applications—in short, all that is vitally necessary to an intelligent understanding of engineering, but this taught thoroughly, so as not to be forgotten.

The better technical colleges realize that the first requirement of an electrical engineer is a thorough general education, and begin to realize that for this purpose it is not sufficient to require general subjects for college entrance and relegate their study to the high school; for even if the average high school were what it should be, and not what it actually is, much of the general knowledge required by an educated man cannot be taught in the high school, since during the high school years the intelligence of the boy is not sufficiently ripened for its grasp, and a review in the college is necessary.

However, even if an attempt is made to teach or to review general subjects, the work is not carried sufficiently far. Mechanical engineering, physics, chemistry, and some civil-engineering subjects are recognized as legitimate subjects of teaching in the electrical-engineering course in many colleges, together with literature, some history, etc.; but physiography, physical geography, meteorology, mineralogy, astronomy, etc., are also of importance in a general engineering education.

To illustrate in the case of chemistry: The electrical engineer should have a knowledge of the laws of chemistry, a familiarity with the elements and their compounds, and a general knowledge of the methods of analysis and synthesis. Such a course must, therefore, necessarily be largely descriptive, and the experimental work largely illustrative.

Astronomy is one of the most interesting and fascinating of subjects. But where taught as a part of the general educational programme, it frequently is all mathematics, and so hopelessly dry and repellent. It should be given descriptively, for in a short course on astronomy it is just as ridiculous to delve deeply into mathematics as it would be to start the teaching of geography with a course in spherical trigonometry.

In conclusion, the main defects in the present electrical-engineering training in some of our colleges appear to me as follows:

1. The insufficient remuneration of the teachers, which makes most of the best men unavailable for educational purposes, and is, therefore, largely responsible for the other defects.

2. The competition between colleges, which leads to a curriculum marked more by the quantity of the subjects taught than by the thoroughness of the teaching. The graduates are sent out with a mass of half-understood and undigested subjects, quickly forgotten, and deficient in understanding of the fundamental principles and in the ability to think.

3. The tendency of some colleges to teach the trade of electrical engineering rather than educate intelligent and resourceful electrical engineers.

4. The unsatisfactory state of the teaching of allied sciences, which gives instead of general view and understanding of the science, a fragmentary knowledge of some details.

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Serial and Electric Directors Meet and Dine.

At a meeting of the directors of the Serial Building Loan and Savings Institution and the Electric Building Loan and Savings Association, held at Shanley's Restaurant, Forty-second street and Broadway, New York, on the evening of January 30, a dinner, with covers laid for twenty-four, was served, after which considerable business of importance looking to the welfare of these associations was transacted. President John C. Barclay, of the Serial, occupied the chair. A committee of six, representing both corporations, was appointed with instructions to report at the next meeting of the directors a plan whereby both organizations may be consolidated. This committee included J. B. Sabine, E. F. Howell and J. R. Beard, for the Serial, and E. S. Butterfield, T. E. Fleming and G. W. Blanchard, for the Electric.

After some discussion regarding the importance of effecting such a consolidation, a number of those present were called upon to address the gathering. J. B. Sabine, the attorney for the corporations, spoke on "The Safety of Savings and Loan Associations Has Been Established by Recent Legislation;" J. B. Taltavall dwelt on "How Properly to Advertise the Institution in Telegraph Circles;" T. E. Fleming, in discussing the question of "How We Built Up the Savings and Loan Associations," said that enthusiasm was the key note of success of the loan associations, as it was the key note of success in all other enterprises; F. C. Leubuscher had for his theme "Esprit de Corps in the Successful Management of Savings Institutions;" J. F. Nathan gave a talk on the "Experiences of a Home Seeker," while J. T. Laidlaw selected as his subject "The Vicissitudes of a Saving Man." Messrs. E. E. Brannin, M. J. O'Leary, E. S. Butterfield, Secretary E. F. Howell, James R. Beard and others made brief but interesting remarks, conveying suggestions having in view the welfare of the association and the expediting of its further development.

The dinner arrangements were in the hands of a committee, of which M. W. Rayens was chairman, and were carried out with a carefulness and attention to detail as to occasion many warm expressions of approval.

At a subsequent meeting held jointly by the directors of both organizations, on February 6, a scheme of consolidation which had been prepared, was unanimously adopted.

J. B. Taltavall, in discussing the subject of "How Properly to Advertise the Institution in Telegraph Circles," said in part:

"The scheme of management presented by the Serial Building Loan and Savings Institution, organized by telegraphers and designed for their benefit, is worthy not alone of the approval of telegraph officials, but also of their earnest and expressed sympathy and practical aid. It should also appeal with profound concern to the individual who would better his condition.

"This institution, like all other business undertakings, must necessarily resort to all proper means to secure its legitimate ends. The question of how best to advertise itself in telegraph circles is a highly important one, and demands careful thought and study, for it means recognition, the practical value of which should spell success. No one man, however great his proved abilities may be, who is charged with the responsibility of management, can accomplish all this unaided. He has a vast amount of detail work to look after. He needs all the assistance that can be rendered him. That is his right, and furthermore, it should be the self-imposed duty of every member of the board of directors, of telegraph officials and of the individual membership to constantly proclaim the advantages this institution holds out to the telegrapher. The esprit de corps should be more pronounced. Praise of the institution should be continually sounded. If all would remember to practice this simple yet effective method of advertising, much resultant good would follow.

"Another thing: the board of directors of this institution should include on its roster the names of heads and of other influential individuals of the various telegraph operating departments. Not only this, but such persons should be expected to personally solicit employees and friends to open bank accounts with this institution; the environment of such a carefully constituted directory would enable its component membership to accomplish much in this direction.

"The question of extending the sphere of the workings of the Serial, giving it a broader national range, should be kept constantly in view, and the subject should receive earnest consideration; also, that members of the profession residing in all sections of the country should be solicited to deposit with this institution their monthly savings. While many persons residing outside of the city already avail themselves of the privileges afforded by the Serial, its benefits might be extended indefinitely were the matter given wider publicity.

"The Serial has been prudently managed, earning its dividends, which have never been less than five per cent., and which have been paid with unceasing regularity, the telegraphic strike and the more recent financial panic in no wise affected its deposits, its earnings or its dividends. We are proud of the record and of the brotherly help and interest this institution has ever manifested in behalf of its membership. It has been the means of providing homes for hundreds of its members during the past quarter of a century. It is a splendid organization, and is so regarded by the banking department of the state of New York, under whose control it is, and which has expressed warm encomiums for the ability and clear-sighted intelligence that has guided its affairs. While this is flattering, a greater unity of purpose and action on the part of the entire membership would constitute a working force of the whole of tremendous momentum—invincible in

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strength and power, that would lead to a wider expansion of activities.

"An institution so important as the Serial, which has conferred such benefits in behalf of the telegrapher, and which is calculated to make a very much larger impress upon the telegraphic world, is worthy of and should be able to command the best thought and co-operation of those for whose benefaction it was organized."

A Newfoundland Telegraph Dispute.

Judgment was recently delivered in the case of the Anglo-American Telegraph Company vs. the Reid-Newfoundland Company, in which the plaintiff company claimed an account of commercial messages over the telegraph line between St. John's and Whitbourne, Newfoundland, under an agreement with the Newfoundland Railway Company, dated August 11, 1888, and of which it claims the Reid-Newfoundland Company is the assign. The defendant company held that it was not an assign of the Newfoundland Railway Company in so far as this agreement was concerned.

The judgment states: "The defendant company, however, took the special wire from the government under the contract of 1898, which conveyed an estate comprising the whole of the unexpired term of twenty-seven and one-half years, which the agreement gave in the special wire. If the special wire has not been conveyed by this contract, then the defendant company's occupation of it must be wholly wrongful, and it would be liable for every use made of it. The conduct of the defendant company, as well as its contract, shows it to be in the position of an assign. It conformed to the terms of the agreement of 1888 and took its benefits. From April 1, 1898, it held the special wire with the owner's consent and must be presumed to have done so on the terms set forth in the agreement."

The original agreement with the Newfoundland Railway Company provided that the special wire referred to was for the special and exclusive use of the railway company, and to be so constructed and maintained as to afford the railway company constant communication between each of the railway stations, between St. John's and Harbor Grace, and Harbor Grace and Carbonear. Commercial messages were held to be all business messages paying toll, or contributing to the earnings of the company. It was ordered that account be taken before the registrar of all messages transmitted over the special wire by Sir R. G. Reid, and the defendant company, other than messages connected with, or for purposes incidental to the management, operation or control of the line of railway between St. John's and Harbor Grace, via Whitbourne, and between Harbor Grace and Carbonear.—The Railway and Marine World.

Mr. Edison and the Old Remington Model.

Edwin C. Barnes, western manager of the National Phonograph Company, in addresses recently before the Business Science Club, of Chicago, recounted the connection of Thomas A. Edison with the original model of the Remington typewriter. The inventor, it will be recalled, was G. Latham Sholes, of Milwaukee. The machine wrote fairly well but refused to "line up." So he took the model to Mr. Edison to perfect.

Mr. Barnes, in discussing the incident, said:

"When Mr. Sholes invented the typewriter he took it to Mr. Edison to perfect. I have often heard Mr. Edison tell the story of how he first became acquainted with this interesting and essential office assistant. He tells how Mr. Sholes came to him, with an old wooden model of a machine which he said would write letters. He tells how he worked on it ceaselessly for a long time, and discovered that the worst feature of the proposition was to get the letters to line up.

"After perfecting the operation of the wooden model, Mr. Edison set to work to make a metal machine. He built and perfected the first steel typewriter ever produced. The castings were made in his own shop and the parts turned out in his own laboratory. The first machine worked and wrote letters, and he succeeded in securing the alignment that he sought, but he could not understand what use the machine would ever be from a business standpoint.

"In the recounting of this story I have heard him tell how he would ask one of his assistants to take a pen and paper and write a given sentence while he punched it out on the typewriter. The result was that the penman wrote the sentence two or three times while Mr. Edison was writing it once on the typewriter. This seemed to prove to him that it would not go.

"Notwithstanding this test, he continued to build these steel typewriters and the demand steadily increased. All this time Mr. Edison was at work on the Business Phonograph, believing that it was the solution of the detail of correspondence. After seeing the utility and demand created for the typewriter, he saw a possibility for a connection between his machine and the writing machine which would eventually do away with all of the hampering details of carrying on business correspondence."—Office Appliances.

Astral "Telegraphy."

For any gentleman possessing a patent system to open up communication with the moon or other planets by telegraph or otherwise, says the London Globe, the French Academy of Science offers a prize of $20,000. The amount seems trifling, considering the sums that are being offered for mere flying machines, but learned bodies do not possess the wealth of some newspaper proprietors. The prize, it is gravely announced by the academy, will be awarded in 1910 in the event of its being won. It should be added that the planet Mars is barred, on the ground that communication

Arborvitae Poles for Telegraph Purposes.

The United States Government Forest Service says:

Arborvitae, on account of its strength, lightness, durability, and form, is the most desirable telephone and telegraph pole timber. Its use has been extended to regions remote from the base of supply and rapid depletion has resulted. This is indicated by a rise in price for thirty-foot poles of 156 per cent. in the last eleven years. Arborvitae is extremely slow in growth, and under natural conditions does not form a close stand. Hence a supply large enough to meet an annual consumption as large as the present one cannot be expected from future growth. As a consequence it becomes necessary to investigate carefully every possible method of handling the poles to increase their length of service.

In experimental work along these lines, which the Forest Service has been conducting in cooperation with the American Telephone and Telegraph Company, fifty green thirty-foot arborvitae poles were cut every month for nine months. The first fifty were cut April 22, 1905, and fifty monthly thereafter until December, 1905, inclusive.

All poles were peeled immediately after being cut and were then skidded in the woods in single tiers about two feet above the ground. Each pole was numbered, its weight taken, and its circumference at six feet and at thirty feet from the butt recorded. The poles were weighed by means of a "steelyard scale."

After a long period of seasoning the circumferences were again measured at six feet and at thirty feet from the butt in order to determine the amount of shrinkage. A series of circumference measurements was made also at the butt and at successive five-foot points to determine the volume, weight per cubic foot, and taper of an average pole. Note was made of checking during seasoning.

Upon completion of the seasoning experiment different methods of preservative treatment of the pole butts were tried, consisting of brush treatments with carbolineum and creosote and open-tank treatments with creosote. Records were kept of duration of treatment, temperature of oil, and depth of penetration.

The conclusions arrived at in the seasoning process are:

(1) Green arborvitae poles lose the larger portion of their moisture from the sapwood. This is very thin, consequently loss begins immediately after exposure to favorable seasoning influences, and a large per cent. of the moisture is lost during sixty days of fair weather. Spring and early summer offer the best conditions for maximum seasoning in the shortest time.

(2) Poles cut and peeled during late fall and winter and skidded in a single layer well off the ground should be held until the first of May before shipping, thus insuring a decrease in freight weight more than equal to the expense of holding. Poles so held will also gain in strength and durability.

(3) Late fall and winter offer the best conditions for cutting, skidding and hauling, and these operations should be carried on at that time.

(4) The amount of shrinkage during seasoning is too small to be taken into account.

(5) Checking during seasoning has no particular effect on the strength of the pole and is of little assistance in the absorption of the oil. Checking is greatest in the spring and summer cut poles.

The treatment of the poles should be as follows:

(1) If arborvitae poles are properly seasoned the sapwood can be thoroughly impregnated with creosote in the open tank.

(2) Fall and winter cut poles should be in satisfactory condition for impregnation by the following June if skidded according to the plan followed in the experiment. If skidded several layers deep, as is the usual custom, they will probably have to be seasoned for a longer period.

(3) With seasoned poles the sapwood can be thoroughly impregnated by a hot-oil open-tank treatment of three to seven hours between 212° and 220° F. Probably the three-hour period is as efficacious as the seven-hour, the differences in the experimental treatments being due to variations in the amount of sapwood and not to the duration of the bath.

(4) After the immersion in hot oil a bath in the cold preservative is necessary. Unless the oil is changed at the conclusion of the hot bath the fires should be drawn and the poles allowed to remain in the oil until it has approached atmospheric temperature.

(5) Green arborvitae poles show great variation in open-tank treatment. Penetration is neither deep nor uniform and is not sufficient to justify the treatment for this class of material.

(6) Brush treatments of green poles can not be justified.

(7) The penetration on brush-treated seasoned poles is slight. The value of this method of treatment can be determined only by experience.

(8) Seasoned tamarack poles show fairly deep and uniform penetration of the oil when treated in the open tank. Further experiments with this timber are desirable.

In selecting a locality for setting the poles a region will be secured in which normal conditions are represented. The poles will be placed so as to include varying sites and exposures.

The poles will be set in such a manner that each contrasting series will be under practically the same conditions. The following scheme will be followed: (1) Tank treated; (2) carbolineum brush treated; (3) tank treated; (4) creosote brush treated; (5) seasoned, untreated; (1) tank treated, etc.; three tamarack poles will be included in the line. The 489 arborvitae poles will form a continuous line 12.2 miles long, 40 poles per mile.

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A Directive System of Wireless Telegraphy.

E. Bellini and A. Tosi recently had an interesting article on the directive system of wireless telegraphy in the Electrical World, from which the following is taken:

A closed oscillator circuit, placed in a vertical plane, does not radiate equally in every direction of the horizontal plane like the open-rod oscillator, or antenna, employed in the usual wireless telegraph system. Lines of electric force detach themselves from the closed oscillator and extend to the earth, such lines being propagated chiefly in the plane of the circuit; the radiation is zero in a direction normal to the plane of the closed circuit.

In consequence of this, a system which makes use of the properties of closed radiating circuits is of itself alone a directive transmitter system. Since, however, the radiation from closed oscillators is weaker than that from open ones, it was necessary to prove that, when such closed circuits are employed, the distances reached in ordinary radiotelegraphic communication could be easily attained. Further, in actually obtaining radiotelegraphic communication by the employment of closed circuits it was also desirable to make certain that the energy required was not excessive.

The experiments were made by the authors, thanks to the kind permission vouchsafed by the French government, between three stations on the Normandy coast. These stations were erected in the neighborhood of Dieppe, Havre and Barfleur, each station being provided with a mast 50 meters in height. Since one mast only was used to sustain the closed radiating circuit, this latter was given a triangular shape in place of the circular form. The symmetrical sides of the triangle were formed of a trellis of nine parallel copper strands, spaced twenty centimeters apart, each strand consisting of seven wires 0.9 millimeter in diameter. The distance between the upper ends of the trellis forming an armature of the condenser was 2.5 meters; that between the lower extremities, ending at two meters from the ground, about 55 meters. The conductors of the trellis were all joined together at the base, and two wires of the same strand of the trellis served to make connections with the apparatus.

The distance between the Dieppe and Havre stations is about 90 kilometers; that between Dieppe and Barfleur about 170 kilometers. The angle enclosed between the directions Dieppe-Havre and Dieppe-Barfleur is about 23 degrees. The line joining Dieppe with Barfleur lies entirely over sea, while the transmission Dieppe-Havre has to pass over land the whole way; in consequence, Dieppe can be considered as being radiotelegraphically equidistant from Havre and Barfleur.

Dieppe was chosen as the transmitting station and Havre and Barfleur as receiving stations. The energy for the transmission was supplied by a storage battery, the current from which, broken by a mercury interrupter of the Foucault type, passed to one or two induction coils of 30 centimeter spark-length. The receiving stations were equipped for the reception with a Ferrié electrolytic detector connected to an ordinary vertical antenna and to earth.

The Arc in Wireless Telegraphy.

The Electrical Review, of New York, in referring to a new telegraph station erected on the east coast of England by the Amalgamated Radio Telegraph Company, says:

This station uses the De Forest spark apparatus which utilizes the oscillating arc for setting up electric waves. It is the description of the latter apparatus, which is of particular interest. Due to the fact that the ordinary commercial supply may be utilized, the apparatus requires very little space, as no special generating equipment is called for. Of course, if alternating currents only are available, a direct-current generator, driven in some way, would be necessary for operating the arc. The remainder of the apparatus consists of a special arc lamp enclosed so that the arc may be surrounded by an inert atmosphere, and a few condensers and inductance coils. The receiving apparatus is also comparatively simple, a resonant circuit being all that is necessary to catch the signals. To render these distinct in the telephone, however, a little device is needed, because the period of oscillation is too high for the telephone diaphragm to respond to. This is a little vibrating switch or relay called a "ticker," which is closed by the oscillating currents set up in the receiving circuit, and which discharges a condenser through the telephone, thus producing an audible signal.

One striking feature of this equipment is the noiselessness with which it operates. In spark telegraphy there is always a more or less loud report with each discharge, and where high-power stations are operated, the noise is very considerable. There is nothing of this kind in employing the arc lamp, for the oscillations set up by the latter are entirely inaudible, and they are impressed upon the antenna continuously. To send out the signals, all that is done is to change the frequency of these oscillations so as to bring them to the proper pitch, which is done by short-circuiting a few turns of the inductance coil by a telegraph key. There is no sparking at the switch, and the whole system seems wonderfully simple and effective so long as the arc itself is maintained in the proper condition.

This method of operation, by simply changing the wave-length of the oscillation, is neat, but it will probably cause some trouble if many stations are to be operated at the same time in any one neighborhood. In other words, electric waves of two frequencies are set up, each of which is capable of producing interference at other stations. On the other hand, if it be shown that the oscillations set up by the arc are more nearly harmonic than those given out from a spark system, tuning can be carried out more accurately, and there should be really less trouble from interference.

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Grand Trunk Railroad Pension Fund.

At the last semi-annual meeting of the Grand Trunk Railroad shareholders $200,000 was appropriated as a nucleus of a pension fund for the officials and employes, and it was announced that in addition to the income from this sum, it will be necessary for the company each year to supplement it by an appropriation, now estimated at from $70,000 to $75,000 per annum.

The operation of the fund became effective on and after January 1, 1908, when the rules were published to all the 35,000 or more employees on the rolls. The rules will apply from the highest to the lowest of the staff in Canada, from the general manager himself down to the section-men and gate-keepers. They require absolutely the retirement from active service of every officer or employee when attaining the age of sixty-five years, and if he has entered the service before the age of fifty, and has served for fifteen years, or more, he is entitled with the approval of the pension fund committee to an annuity of one per cent. of the average annual salary paid for ten continuous years, for each year of uninterrupted employment, the basis of calculation being the same as that practically universal on this continent. Thus, if a man has served, say, thirty years, receiving an average of $1,000 a year on the pay rolls for the last ten years—or for any period of ten years during his term of service—he would be entitled to one per cent. of $1,000, equal to $10 by thirty years, or $300 a year. The company, however, have made a provision that irrespective of rate of pay or service, the minimum allowance to be paid under any circumstances will be $200 a year, and this without any counterbalancing maximum. The allowance from this fund will be on the highest average rate of wages for any ten consecutive years' continuous service. Any employee over fifty years of age, after fifteen years of service, if discharged without cause, at any time previous to reaching the pension age limit, becomes eligible to pension in proportion to the number of years of service up to date of discharge. Although it was originally considered desirable to follow the general rules prevailing in Great Britain, of the formation of such fund by mutual contribution from the company and employees, it has been finally decided to follow the practice of companies generally on this continent, of contributing entirely out of their own revenues the necessary funds for the pensioning of their aged and faithful employees.

The pension department will be administered by a pension committee selected by the company from among its official staff (themselves possible beneficiaries), whose decisions will be final in all matters pertaining to the administration of the fund. The benefits of the fund will also apply to worthy employees who may have been injured in the company's service, or who have suffered the loss of faculties which render them incapable of self-support, such employees having served the company the minimum period of fifteen years—whether the age limit has been attained or not.

While the Grand Trunk Railroad established, a number of years ago, what is known as the Superannuation and Provident Fund Association, which is still in existence, its membership is limited to the official and clerical staff throughout its lines in Canada only, whereas the new fund will apply to employees on all lines of the present system, and to all classes of employees. The Superannuation Fund will continue in operation with the registered membership as of December 31, 1907, but will be closed against the admission of any new members after that date. It is anticipated that the pension scheme will form an admirable adjunct to the company's Insurance and Provident Society, which has been so many years in operation; the weak point in which has always been the inability of an aged or permanently disabled employee to keep up his payments to the insurance fund, although privileged to do so. Hereafter a very small deduction from his pension allowance will enable an employee to make provision for his family up to a maximum amount of $2,000.

The pension committee nominated by the directors has elected C. M. Hays, chairman; W. Wainwright, vice-chairman, and H. B. Moore, secretary.—The Railway and Marine World.

Some New Methods in High Tension Line Construction.

H. W. Buck, in a recent paper read before the American Institute of Electrical Engineers, in discussing some new methods in high-tension line construction, said in part:

The great economies in the cost of generating power which have been obtained in the large steam turbine stations and hydroelectric plants, are leading to the general abandonment of small generating stations and the increase in transmission distances in order to distribute power over a large territory. In other words, 100,000 horsepower can be generated in one station and transmitted 100 miles cheaper than it can be generated and distributed from ten 10,000-horsepower stations near the center of load. On account of this tendency toward the concentration of generating units, the overhead transmission line has assumed a position of great importance in electrical installations, and the same permanency and reliability is demanded of it as of the generating station itself. The wooden pole line of the past has been practically abandoned and steel construction has been substituted.

The long distances covered by many of the modern lines, the large amounts of power to be transmitted, and the very high price of copper and aluminum—all have combined to force up the transmission voltage to the highest practicable limit. In consequence the demand for high-voltage overhead line insulators has outgrown the present standard practice, and some new systems will have to be introduced to meet the new conditions.

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Reminiscences in the Busy Life of an Old-Time Telegrapher.

BY JAMES F. GORMLEY, OF BOSTON.

(Continued from issue of February 1.)

Events transpiring early in the year 1861 were portentious of the coming storm incident to secession and subsequent battle. People were keyed up to the highest pitch of excitement, and this great country rocked in the fearful unrest with which it was seized at that time. The calm of other days had departed, there were huried movements of the military, and armed camps began to appear. In the border states neighbor was arrayed against neighbor, and suspicion and distrust were rife on every side. At this time and in the midst of such an atmosphere I was stationed in Baltimore and was in the thick of the disorder. Much of the sentiment, of the prevailing fear, the hopes, the heart burnings, the business troubles were disclosed to me, revealed in the messages that came under my eye through my occupation as a telegraph operator. So, too, I became cognizant of much that was transpiring of a political character, even though the use of code concealed the most important information.

The tempestuous scenes of which I was a spectator made such a vivid and lasting impress on my mind that nothing has been lost of their distinctness by the lapse of years. Yet restoring changes incident to time have since been so many and so profound, healing animosities and obliterating all traces of war, that as I now recall that stormy period it seems almost like lifting the veil shutting out an unreal and remote past. It is sometimes difficult to realize that within the span of a single life one could have lived through such experiences and now to have the whole four years and more of strife briefly referred to in the simple summing up of the "late unpleasantness." You may be sure it meant much to the individual as it did to the nation while it lasted. The telegraph operator, by reason of his vocation, was "behind the scenes," so to speak. His key reflected closely the pulse of the country. I was in New York, whither I had gone to be married, when the attack on the Sixth Massachusetts regiment occurred in Baltimore. I happened to drop in at the Metropolitan Hotel to see my old friend and chum, John K. Calvert, who has lately been retired and pensioned by the Western Union Telegraph Company, and who was manager of the branch telegraph office at that well-known hostelry, when he greeted me with the remark: "Well, you have been raising ——— in Baltimore!" My superintendent ordered my immediate return to Baltimore, for there was urgent need of the service of every operator. Much difficulty was experienced in transit between Philadelphia and the point of my destination, but at last I managed to reach my post of duty. During the summer of 1861 I was frequently sent over to Washington to help out, and was a witness to many thrilling scenes and transmitted many thrilling messages. In the fall of that year the House printing telegraph instruments were abandoned on our line and the offices along the route from Washington to New York were ordered to be kept open all night because of the heavy demand upon the wires.

Soon after this I was back again in New York. F. O. J. Smith, a shrewd, energetic man, a native of Maine and a power in the early history of the telegraph, and who was the originator of the first eastern telegraph lines, had built a line from Portland, Maine, to New York, known as the Independent, and had opened the New York office at the corner of Nassau and Cedar streets.

At this period there were but few branch Morse telegraph offices in New York located above the main office of the Washington lines, which had been removed from Wall street to 145 Broadway. These offices, as I remember going up Broadway, were located as follows: Astor House, where Augustus Swan was manager; St. Nicholas Hotel, Metropolitan Hotel, La Farge House, New York Hotel, Everett House and the Fifth Avenue Hotel. There was another, situated in a private post office known as Bentley's Madison Square Post Office. Then there were two others still, located in the hotels connected with Allerton's cattle yards, one on the east side and the other on the west side of town.

In considering the local telegraph situation the inadequacy of these few offices to handle what should be the legitimate telegraph business of so large a city as New York, impressed one very forcibly, and I became convinced that it could be measurably expanded. With this thought revolving in my mind, and trying to mature some plan by which a more comprehensive system might be established which would yield corresponding personal benefit to myself, I chanced to make the acquaintance of Frank Smith, a fine, active fellow, the son of F. O. J. Smith. He and another were constructing lines to Albany and so to connect with the West, for the Independent and United States Telegraph companies. I thought I saw my opportunity and suggested that I start a city line to be operated in conjunction with their system. My proposition was that I build the line, they furnishing wire, instruments and stationary, and work the main office end. I offered to deliver all their messages above Canal street and to turn in all business I could secure, retaining a commission of twenty-five per cent. My proposition was accepted, and I lost no time in putting my plan into execution. I opened the first branch at French's Hotel, at Park Row and Frankfort street, now the site of the World building, wires thereto being run over the housetops. This was a good beginning, for the location was an excellent one for business, was convenient to the newspaper offices, and French's Hotel at that time enjoyed an excellent reputation.

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In those days Broadway from Chambers street to Fourteenth, following the west side of that thoroughfare, was the great promenade of the town. Here were located the best houses in the retail trade. The west side of the street was denominated the "fifty-cent side," while the east side was known as the "twenty-five-cent side." At the northwest corner of Broadway and Franklin street was Taylor's saloon, a famous restaurant, the finest in America, splendid and showy in white and gold, decidedly French in style. The upper portion of the building was occupied as the International Hotel. Taylor's was the resort of the elite of the town. In this gorgeous place I secured the privilege, rent free, of establishing an office. It was a neat little affair, a portion of the counter near the entrance door being surrendered for the purpose. It was fitted with a key and sounder and enclosed by an ornamental rail, and attractive signs were displayed. This office attracted much attention, and the advantages of the location soon became apparent. I was warmly congratulated over so fortunate a selection by those who were connected with me in my enterprise, including Frank Smith, his associate in telegraph line construction, a Mr. Lane; by Mr. Morgan, who was connected with the United States Telegraph Company, and by Col. J. J. Speed, president of the Independent line. The latter expressed his satisfaction by entertaining a party of us at dinner served on a near-by table in the big apartment.

My next move was to run a wire to the Westchester House, at the corner of the Bowery and Broome street. The old hotel is still standing, although shorn of much of its former prestige. There was a good deal of business to be picked up in this neighborhood, considerable originating with the near-by Bowery Savings Bank in maintaining communication with its branch on Wall street. As usual, no charge was made for rent, the desirability of having a telegraph office on the premises being regarded as a full equivalent for the surrender of the space necessary for the purpose. A like arrangement was made with the St. James Hotel, a fine new house at that time, at Broadway and Twenty-sixth street, just above the Fifth Avenue Hotel, with the telegraph office at which my office came into competition. At this point I established a bulletin board on which was displayed many items of current news, the chief feature, however, being the posting of legal information, all of which was attractive to lawyers, and which served incidentally to influence business to our line.

(To be continued.)

Calling Device for Wireless Telegraphy.

An automatic calling device for a wireless telegraph station, constructed by W. R. Carroll, is in use on Yerba Buna Island, San Francisco Bay, under control of the United States Navy Department, and is said to be satisfactory in its operation.

In addition to the wireless telegraph equipment of this station there is a wire telegraph system of the Postal Telegraph-Cable Company, connecting with the Commercial Pacific Cable Company's line to Hawaii and the Orient, and also local and long distance telephones.

The wireless telegraph station communicates regularly with the navy's wireless stations at Mare Island on San Pablo Bay, twenty miles away, and with Farallone Islands, thirty-five miles at sea beyond the Golden Gate. The transmitting apparatus is similar to that in use at all modern wireless stations. The receiving devices include a coherer system with tape recording apparatus; an electrolytic receiver with high resistance double-head telephone receivers and a magnetic detector so arranged that it can be left attached to the transmitting aerial at all times even when sending. By this arrangement it becomes possible for the receiving station to "break" the sending station, just as is true on land lines, and to secure at once a repetition of lost signals instead of waiting until the sending has ceased as is done with all other receivers.

There are four transmitting or type wheels on the auto-sender and a half-wheel or aerial control wheel, as it may be called. The calling wheels bear the call letters of the different stations. All of these wheels and the half-wheel are on a common shaft which also carries the drive wheel of a set of gears which propels the traveling iron core of the magnetic detector and the whole is belted to a small motor. The speed of the motor is controlled by a slide rheostat, and a telephone hook switch in the circuit serves to set the mechanism amoving when the telephone is taken up for receiving or whenever it is desired to start the automatic sender.

Telegraphy in Cuba.

Mr. A. Campbell Turner, charge d'affaires of the American legation at Havana, forwarded copies of three decrees of the provisional governor of Cuba, establishing state telegraph offices, to be connected with the post-offices in the following places in Pinar del Rio province: Orozco, Quiebra Hacha and Cabanas. In these offices the postmaster is to be required to pass an examination as telegrapher and is to fill both posts. It is proposed in the future, in all the smaller towns in the interior of the island where the work of the post-office will so permit, to combine the offices of postmaster and telegrapher and to make applicants for these positions pass an examination in telegraphy before receiving their appointment.

The telegrapher in the hotel lobby asked the customer if she would wait for the reply to her message or wished it sent to her room. "You'd better send it to my room," replied the lady, who had just telegraphed to her husband. "It will take some time to get a reply from Henry; he stammers so."

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The Berjonneu System of Electric Transmission of Pictures.

A description is given here of a system of transmitting pictures electrically which has been exhibited in Paris by Pascal Berjonneu. During this exhibition wires were connected up so as to form a loop of telegraph lines from Paris to Marseilles and back, a distance of over a thousand miles. Pictures were transmitted over this at the rate of one each fifteen minutes. Then the apparatus was disconnected from the wires and connected to a number of wireless-telegraph relays, the receiving apparatus, properly connected, was placed in the same room and the pictures were transmitted from one to the other wirelessly, this being the first time that this has been done. The new system does not use selenium, and the apparatus is said to be substantial and small. It is possible to use the system over any line which may be used for ordinary telegraph work or any submarine cable. The line current is small and it is required merely to actuate relays. In brief, the system is merely an adaptation of a Morse key to sending dots and dashes of different lengths. The picture to be sent is etched on metal just as is done to produce a half-tone plate. This metal is thin and is rolled up to form a cylinder which is mounted on a traveling drum similar to that of a phonograph, the feed being one-sixth of a millimetre for each revolution. An insulated platinum point is placed on this, which makes contact only with those portions of the cylinder which stand in relief. As the latter revolves contact is made for a longer or shorter time, causing currents of equal duration to pass over the transmitting wire. In the receiving station a sensitive film is mounted on a similar cylinder, and a ray of light, controlled by a small shutter moved by a magnet through which the line current passes, falls upon the film, thus producing the record. This, of course, consists of lines of dots and dashes one-sixth of a millimetre apart. The intensity of the current does not enter into the operation at all, this acting merely to open or close the window through which the beam of light passes. The system requires, of course, that the sending and receiving apparatus run in synchronism but the method by which this is secured was not described.—New York Electrical Review.

Photographing at a Distance.

A description of an apparatus suggested by S. Sivelli for the purpose of reproducing at a distance the optical image of a photographic objective, is presented in abstract form by the Electrical World. The sending apparatus consists of an ordinary photographic camera, the sensitive plate of which is replaced by a plate made up of a network of small selenium cells, insulated from one another and communicating with a constant source of electricity, the negative terminal of which is connected to earth. From each of these selenium cells there starts an insulated wire, dipping into a small mercury vessel arranged on a horizontal plane. There are thus as many mercury vessels as there are selenium cells. These vessels are arranged round the circumference of a circle, round the center of which rotates a metal index operated by clockwork, which, with a point attached to its end, will come into contact successively with each of the mercury vessels. This index communicates with a wire connected to the receiving apparatus, and insulated from the remainder of the outfit. The apparatus is to be worked in the following manner: After adjusting the focus for the image to be reproduced, the circuit is closed and the index having been set working, will traverse one after another, the mercury vessels corresponding to the respective selenium cells. The electric current from the battery will traverse the selenium cell actually in communication with the metal index, and according to the more or less considerable action of the illumination on the cell, will undergo a more or less considerable alteration in intensity. These alterations in current intensity, corresponding to the illumination of each of the selenium cells, are thus successively transmitted to the receiving station, there to be reconverted into variable light intensities. The receiving apparatus may be of various kinds; the one suggested by Sivelli is based on the following principle: a cylinder performing a translation and a rotation is surrounded by a sheet of white paper, at a short distance from which a style communicating with an electro-magnet is arranged. If everything be adjusted in order to eliminate any variation of current intensity as long as the luminous intensity in all the selenium cells is the same, each current closure will result in the production of a dash of more or less intensity, according as the selenium has been acted upon more or less strongly. The sheet of paper will thus be covered with a set of dashes reproducing with greater or less approximation the optical image by the photographic objective. The method thus outlined is obviously a purely hypothetical one. To produce an image at the receiving end that shall be coherent enough to be intelligible, the number of cells would have to be at least 1,000 to the square inch; and unless vastly more sensitive means than selenium cells can be devised for converting the variations of light intensity into variations of current strength, the idea seems impossible of realization.

The question as to what tests for commercial lightning-arresters might be properly incorporated in the standardization rules of the American Institute of Electrical Engineers has lately been considered by the Standardization Committee. The committee finally decided not to adopt any lightning tests in the new edition of the rules adopted June 21, 1907. However, the sub-committee on lightning-arresters hopes to get a full consideration of the subject for the benefit of a later Standardization Committee.

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Radio-Telegraphy.

One thousand reservists attached to the German military telegraph corps have been called up for training in order that they may become familiar with the wireless apparatus.

While the cable connecting Scotland with the island of Shetland, belonging to the English post office, is disabled, communication has been established between Shetland and the mainland by wireless telegraphy.

A patent, No. 876,996, for intelligence intercommunication by magnetic wave components, has been awarded to G. W. Pickard, of Amesbury, Mass. Has closed electrical circuit of large area in inductive relation, and detector circuits, etc.

The recently reported transmission of a wireless message from the Nauen station, Germany, to the steamship Cap Blanco, at Teneriffe, which represents a distance of nearly 2,300 miles, is claimed by a Berlin newspaper to have established a record, and to have surpassed the achievement of the Marconi system between Ireland and Newfoundland.

A patent, No. 877,451, for means for receiving intelligence communicated by electric waves has been issued to Greenleaf W. Pickard, of Amesbury, Mass. This receiver for "wireless" waves comprises two substantially massive individual conducting solids, one of which has low resistivity and the other high resistivity and also thermo-electromotive power. the conductors being operatively connected together in substantially perfect electrical contact.

A bill to organize the business of wireless telegraphy in accordance with the decisions reached by the International Commission, which sat in Berlin in 1903, and the International Congress, which was held in 1906, has been introduced in the German Reichstag by the Minister of Posts and Telegraphs. The fundamental principle is to compel navigation companies, as well as the owners of land wireless stations, to arrange for intercommunication without regard to the system used; otherwise permission for the erection of stations for wireless on board ships will not be given. It is understood that the enactment is intended to give the fullest scope to all systems.

It is stated from Washington that the Republican members of the Senate have reached a virtual agreement to take no action relative to the wireless telegraphy treaty which has been pending before the Committee on Foreign Relations since almost the first day of the session. This conclusion is in spite of the fact that a dozen or more great powers have already approved the treaty and are now waiting for the co-operation of the United States. It is purposed to let the wireless treaty remain in the committee indefinitely while the Navy Department watches the behavior of the wireless companies. If they refuse to transmit distress signals or to show reasonable co-operation the treaty will be taken from its pigeonhole and ratified. The passage of the treaty would place all companies under international supervision.

William Marconi recently said that "the transatlantic wireless system will be opened to the public in February, and that in the beginning the service will be between London and Montreal only via Clifden, Ireland, and Poldhu, Cornwall, on the eastern shore of the Atlantic, and Glace Bay on the western shore. Montreal was chosen as the beginning point for the transmission of business and private messages because Canada has subsidized the wireless system to the extent of $80,000." In explaining the effort of the American telegraph companies to stifle the wireless company, through fear of its competition, Mr. Marconi said: "The telegraph companies placed a grave obstacle in the way of our success by refusing to accept at press rates messages filed in New York for transatlantic transmission via Glace Bay, thus adding from three to four cents a word to the cost of an eastbound message, while the regular press rates from New York to Glace Bay were only one cent a word. This difficulty was solved by the New York editors with reference to westbound messages by appointing me their Nova Scotia correspondent. The rate on private messages between London and Montreal will be only twelve cents a word. It is understood that no attempt will be made, at least for the present, to lay private wires to the wireless terminals."

UNITED WIRELESS REPORT.

The United Wireless Telegraph Company has mailed to stockholders the following financial report as of November 30, 1907:

Assets.

Good will and patent rights	$500,000
Treasury stock, preferred and common	6,659,110
Stock and bonds of other wireless companies	12,459,263
Works, Jersey City	23,405
Station, boat and aerogram equipment	229,988
Furniture and fixtures	4,085
Cash, accounts receivable	241,612
Total	$20,117,463

Liabilities.

Capital stock	$20,000,000
Bills payable	2,534
Accounts payable	114,929
Total	$20,117,463

As the company was only formed February 14, 1907, no comparison with a former period can be made. The United Wireless was organized to take over the affairs of the DeForest Company and to unify wireless interests, and the president says the progress made during 1907 was satisfactory. In that time the number of ships equipped with the apparatus of the company has

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been considerably augmented, and a chain of coast stations completed from New York to Galveston. On the Pacific Coast a chain of stations from San Diego, Cal., to the Canadian border is practically finished. Land has also been acquired at Vancouver, B. C., for a station, and the erection of the plant at that point will begin as soon as the necessary permit can be secured from the Canadian government. Stations on the Alaskan coast will be established this year. President Wilson reports a number of orders for equipment from ship owners, and says the outlook for 1908 is that several hundred vessels will install the apparatus. Inquiry among shipping people indicates that the service they are receiving from the United Wireless is satisfactory. From this service the company is deriving a good revenue. The company has about 12,500 stockholders.

Mr. Tesla's Contribution to Wireless Telegraphy.

The following letter is a part of a communication from Nikola Tesla appearing in the New York Times under date of January 26:

"I read in your issue of to-day that, according to Lieutenant-Colonel Chales, director of military telegraphs of France, a wireless message 'should theoretically go around the world.' If you will take the trouble of perusing my French patent, No. 354,791, you will find that this has long since ceased to be a theory, for that document, while bearing the date of April, 1905, describes experiments which I made in the fall of 1899, one of which was to pass currents of 100 amperes around the globe, a mere breadth in view of its immensity, but more than necessary to affect a sensitive receiver. You will also notice that in those tests I used 'undamped' oscillations, one of my earliest improvements, which you seem to find pleasure in attributing to other electricians. These facts are mentioned incidentally, merely with the desire of informing you correctly.

"What I wish to bring to your attention relates to certain provisions of the last wireless conference which are now being considered by the United States Senate. Some of the rules were undoubtedly proper and applicable to 'radio-telegraphy' by electromagnetic or Hertzian rays, in view of the impossibility of preventing interference and because many different forms of apparatus were employed. But since that time the Hertz waves have been abandoned by the more advanced experts and a uniform system adopted which permits the simultaneous transmission of any desired number of wireless messages without interference and with a precision and accuracy equal to, if not greater than, that practicable with cables."

Paris was recently cut off from nearly all telegraphic, telephonic and cable communications by a storm of great violence which descended upon the northern coast of France.

The Plan of S. M. English to Promote Efficiency.

S. M. English, general manager of the Postal Telegraph-Cable Company of Texas, at Dallas, Tex., has issued the following circular letter addressed to all managers and which has been posted upon the bulletin-boards of the various offices of that system:

So few operators understand wire and cable testing that I believe it will be a good plan to try again to interest them in this branch of the service. Every manager should have a thorough knowledge of every branch of the service so that he may take up the work of any employe who may be absent from duty, and should see that every employe is taught all he is willing to learn about the wires and apparatus and clerical work, so that he may be in line for promotion or competent to relieve the chief operator or manager who may be absent from the office from sickness or other cause. In this connection I strongly recommend the Telegraph Age, because a series of articles on "How to Become a Wire Chief" was begun in the February 1 issue. Also the book just issued, "Electrical Instruments and Testing," by Norman H. Scheider, containing a chapter by Mr. Jesse Hargrave, formerly chief operator at New Orleans, of the Postal Telegraph-Cable Company, and later assistant electrical engineer of the company at New York, in which readers are given the benefit of his knowledge gathered from actual work at the switchboard.

I shall also be pleased to renew my offer to explain to the best of my ability anything that may not be clear if operators will write me stating what is desired. I might add that when I began to study along this line about all the information I had was from the columns of Telegraph Age and The Quadruplex, published by Maver and Davis. The latter furnishes excellent illustrations and explanations of the fundamental principles of the duplex and quadruplex and should be read by every one interested.

Success comes to the man who knows things, not to the man who thinks it best to learn after he receives promotion. A thorough knowledge of any business is the stepping stone to promotion.

If the individual members of the force of the Postal Telegraph-Cable Company of Texas, do not show themselves to be competent for promotion when the opportunity for advancement arrives, it cannot be said that the enterprising general manager is at fault. A highly competent and practical man himself, who has worked his way up to the top from the bottom, solving and mastering all the problems encountered on the journey, and with a kindly interest in the welfare of others, Mr. English admonishes those with whom he is associated as he himself has been admonished in the past.

New Incorporations.

There has been incorporated under the laws of the state of Delaware, what is styled the Cuban Telephone and Telegraph Company, the object being to operate all kinds of wire lines in the West Indies. The directors are William Lohman, Daniel C. Beerman and William J. Patterson, all of New York.

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progressive operator; $1.50 a year.

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CATALOGUE OF BOOKS ON THE TELEGRAPH.

Revised to January 1, 1908.

ABERNETHY, J. P.—The Modern Service of Commercial and Railway Telegraphy, in Theory and Practice, including the Railway Station and Express Service; arranged in Questions and Answers; $2.00.

ADAMS, JOSEPH H.—Harper's Electricity Book for Boys. This book will give boys a practical working knowledge of electricity, showing how easily experiments can be made; 407 pages; fully illustrated; $2.00.

BATES, DAVID HOMER.—Lincoln in the Telegraph Office; Recollections of the United States Military Telegraph Corps during the Civil War; 432 pages; illustrated; price $2.17.

CREHORE, ALBERT CUSHING, PH. D.—Synchronous and Other Multiple Telegraphs. Some methods of obtaining independent telegraph circuits on a single wire, both with and without synchronism; 124 pages; 42 illustrations; working diagrams; $2.00.

CROCKER, F. B., AND WHEELER, S. S.—The Management of Electrical Machinery. Has a special chapter by H. A. Foster. Contents: Descriptions and Directions; Examination, Measurement and Testing; Localization and Remedy of Trouble in Dynamotors and Motor Generators. Fully illustrated; $1.00.

HERBERT, T. E.—Electricity in its Application to Telegraphy. A Practical Hand Book Covering the Syllabus of the New Technical Examination. Adopted by the English Post Office Telegraph Department. Fourth edition, with forty-eight illustrations; $2.60.

HOBBS, W. R. P., AND WORMELL, R.—The Arithmetic Electric Measurements; 50 cents.

HOUSTON, E. J.—A Dictionary of Electrical Words, Terms and Phrases; 980 pages; 582 illustrations; $7.00.

HOUSTON, E. J.—A Pocket Dictionary of Electrical Words; leather, $3.00.

JONES, WILLIS H.—Pocket Edition of Diagrams and Complete Information for Telegraph Engineers and Students. This standard work has been carefully revised and 74 pages and 30 diagrams added, including full descriptions of the newest apparatus lately adopted by the Western Union and Postal telegraph companies. It presents the finest study of the complex subject of the telegraph ever published; it explains clearly the equipment of a modern telegraph office, and is a text-book that no student, operator, engineer or official, no matter what his grade, can afford to be without; 334 pages, 52 chapters, 160 illustrations; $1.50.

LOCKWOOD, T. D.—Electrical Measurement and the Galvanometer and its Uses; 144 pages, fully illustrated with diagrams of connections, engravings of apparatus, etc. $1.50.

LOCKWOOD, T. D.—Electricity, Magnetism and Electric Telegraphy; A Practical Guide and Handbook of General Information for Electrical Students, Operators and Inspectors; 376 pages; 152 illustrations; $2.50.

LYNDON, LAMAR.—Storage Battery Engineering; 360 pages; 178 illustrations and diagrams; 4 large folding plates; $3.00.

MARSHALL, PERCIVAL.—Small Accumulators; How Made and Used; an Elementary Handbook for the Use of Amateurs and Students; 50 cents.

MAVER, WM., JR.—American Telegraphy and Encyclopedia of the Telegraph. This fine work, revised and enlarged, treats of the systems, apparatus and operation of telegraphy; 656 pages; 490 illustrations; $5.00.

MEADOWCROFT, WM. H.—A B C of Electricity. This book begins at the very root of electrical science, and contains a vast amount of useful information; 50 cents.

MEYER, FRED L.—Twentieth Century Manual of Railway and Commercial Telegraphy. This work embraces all kinds of commercial messages, train orders, phrases, etc.; 240 pages; illustrated; $1.00.

MEYER, FRED L.—Railway Station Service. A text-book for those who wish to become properly equipped station, baggage, freight or ticket agents; 216 pages; fully illustrated; $1.25.

MONELL, DR. S. H.—The Cure of Writers' Cramp, and the Arm Troubles of Telegraphers. This valuable treatise should be in the possession of every telegrapher suffering from this common annoyance; 50 cents.

OFFICIAL DIAGRAMS of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines. This book has been produced by authority of the Postal Telegraph-Cable Company, and under the personal supervision of John F. Skirrow, associate electrical engineer. All of the engravings are made from the official blue-prints of the Postal company, and are therefore absolutely correct; 134 pages; 105 full-page illustrations; 50 cents.

PHILLIPS, WALTER P.—Phillips Code. A popular, generally used and thoroughly tested method of shorthand arranged for telegraphic purposes, and contemplating the rapid transmission of press reports; also for general newspaper and court reporting; flexible leather cover, pocket size; $1.00.

PRIME, S. IRENAEUS.—Life of S. F. B. Morse. The only work authorized by the family and executors of the great inventor, compiled from original data. This is the finest, most accurate and complete life of Prof. Morse, and includes the history of the invention of the telegraph and the many important business connections with those who were interested with Prof. Morse in the development of the telegraph, that has ever emanated in any shape or at any time from the press; sheepskin; 775 pages, illustrated. The regular price of $6 has been reduced to $3.

POPE, FRANKLIN LEONARD.—Modern Practice of the Electric Telegraph; a Technical Handbook for Electricians, Managers and Operators; 234 pages; 185 illustrations; $1.50.

PREECE, W. H., AND SIVEWRIGHT, J.—Telegraphy. A description of every telegraph system and apparatus used in the English telegraph department; ninth edition; with appendix; 504 pages; 272 illustrations; $2.50.

PRESCOTT, G. B.—Electricity and the Electric Telegraph; eighth edition; 2 volumes; $7.

REID, JAMES D.—The Telegraph in America. A complete detailed history of the telegraph, including the organization of the various telegraph and cable companies; 804 pages; illustrated; full morocco binding. Reduced from $7.00 to $5.00.

SCHNEIDER, N. H.—Electrical Instruments and Testing; with new chapters by Jesse Hargrave, assistant electrical engineer Postal Telegraph-Cable Company, on testing wires and cables and locating faults in telegraph and telephone systems; how to use the voltmeter, ammeter, galvanometer, potentiometer, ohmmeter, the Wheatstone bridge, and the standard portable testing sets; 256 pages; 133 illustrations; cloth, $1.00; full limp leather, $2.00.

SCHNEIDER, N. H.—Model Library, comprising 4 books, viz.: Study of Electricity for Beginners; Dry Batteries; Electrical Circuits and Diagrams; Electrical Bells, Alarms, etc.; bound in one volume; cloth, $1.

SMITH, E. W.—Electricians' Manual of Diagrams; 93 pages; 50 cents.

TALTAVALL, JOHN B.—Telegraphers of To-Day. Biographical and historical sketches of more than 900 leading telegraphers, living and dead; published in 1894; 354 double-column pages, 7 1/2 x 11 inches; gilt edges; imitation morocco binding; only work of the kind; of much practical value to those who would keep in touch with the personnel of the profession; reduced from $5.00 to $1.00, express charges collect.

THOM, CHARLES, AND JONES, WILLIS H.—Telegraphic Connections; Embracing Methods in Quadruplex Telegraphy and other Apparatus; 20 plates with circuits distinguished by being printed in three different colors; $1.50.

WEBER, W. L.—Handy Electrical Dictionary; 224 pages; 32 illustrations; cloth, 25 cents.

WILKINSON, H. D.—Submarine Cable Laying and Repairing; $5.00.

YOUNG, J. ELTON.—Electrical Testing for Telegraph Engineers; $4.00.

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TELEGRAPH SKETCH BOOKS.

LIGHTNING FLASHES AND ELECTRIC DASHES.—A book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; reduced from $1.50 to $1.00.

PHILLIPS, WALTER P.—Sketches, Old and New, by the author of Phillips Code, containing a number of telegraph stories, told with all the charm of that delightful story-writer; 200 pages; illustrated; $1.00.

BOOKS ON WIRELESS TELEGRAPHY.

BOTTONE, S. R.—Wireless Telegraphy and Hertzian Waves; diagrams and illustrations; $1.00.

COLLINS, A. FREDERICK.—A History of Wireless Telegraphy, its Theory, Experiments and Results Obtained; 300 pages; 332 illustrations; $3.00.

COLLINS, A. FREDERICK.—Manual of Wireless Telegraphy; 232 pages; 90 illustrations; cloth, $1.50; leather, $2.00.

FAHIE, J. J.—A History of Wireless Telegraphy; illustrated; $2.00.

KENNELLY, A. E.—Wireless Telegraphy; illustrated with 68 diagrams and pictures; $1.00.

LODGE, PROF. OLIVER J.—Signaling Across Space Without Wires. A description of the work of Hertz and his successors. Contains numerous diagrams and half-tone illustrations; $2.00.

MAVER, WM., JR.—Maver's Wireless Telegraphy; Theory and Practice; 216 pages; 123 illustrations; $2.00.

MAXWELL'S THEORY AND WIRELESS TELEGRAPHY; price $2.00. (See Vreeland.)

MAZZOTTO, DOMENICO, PROF.—Translated from the original Italian by S. R. Bottone; 416 pages; 252 illustrations, $2.50.

SEWELL, CHARLES H.—Wireless Telegraphy, its Origin, Development, Inventions and Apparatus; 229 pages; illustrated; $2.00.

STORY, A. T.—The Story of Wireless Telegraphy; 215 pages; 56 illustrations; $1.00.

TREVERT, EDWARD.—A B C of Wireless Telegraphy; 7 chapters; 20 illustrations; $1.00.

VREELAND, F. K.—Maxwell's Theory and Wireless Telegraphy; 250 pages; illustrated; $2.00.

BOOKS ON THE TELEPHONE.

ABBOTT, ARTHUR V.—Telephony. Six volumes; $1.50 per volume; the set, $6.

DOBBS, A. E.—Practical Features of Telephone Work; new edition about ready; $1.00.

DOLBEAR, A. E.—The Telephone. An account of the phenomena of electricity, magnetism and sound as involved in its action, with directions for making a speaking telephone; 50 cents.

HOMANS, JAMES E., A.M.—Telephone Engineering; 375 pages; profusely illustrated; $1.00

MILLER, KEMPSTER B.—American Telephone Practice; fourth edition; entirely rewritten and greatly extended. This comprehensive study of the subject explains in detail every piece of telephone apparatus; 904 pages; 304 illustrations; $4.00

PRESCOTT, G. B.—The Electric Telephone; 795 pages; $6.00.

WEBB, HERBERT LAWS.—Telephone Handbook. A practical treatment of telephone working and management; 160 pages; 138 illustrations; $1.00.

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A B C CODE, fourth edition; $5.00.

A B C CODE, fifth edition. This book is entirely different from the work known as the "A B C Code, Fourth Edition," and the two should not be confounded; $7.00.

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MOREING, C. A., AND NEAL T.—Telegraphic Mining Code; $5.00.

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Price fifteen cents, reduced from twenty-five cents. No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the manipulation of the key much easier.

Letters From Our Agents.

WASHINGTON, WESTERN UNION.

The sudden death by heart failure on February 8, of Laurence Parker, a member of the operating force of this office for a number of years, came as a distinct shock to his associates, by whom he was highly esteemed.

Another death, that of Mrs. Bender, the wife of Robert W. Bender, of this office, and the mother of J. Wilber Bender, himself an invalid and formerly of this office, occurred after a lingering illness on February 8. Her funeral on the 10th inst. was very generally attended by telegraphers, whose contributions of floral offerings were many.

OTHER NEW YORK NEWS.

Joseph F. Ahearn, telegrapher, eschewing the dots and dashes, has embarked in journalism, his name appearing as editor of the Bronx Star. This is a new weekly publication, the initial number of which made its advent on Sunday, January 26, its slogan being "For a Great and Greater Bronx." To further this worthy purpose Mr. Ahearn will bend all his energies. His long experience gained in the telegraphic field, should serve him well in this new undertaking, and like many another who has exchanged successfully one profession for the other, it is hoped that Mr. Ahearn has entered upon a congenial career.

The International Vailograph Company, of Minneapolis, Minn., manufacturers of the "Vailograph," the transmitting instrument, the advertisement of which has appeared lately in this journal, under a recent date, write: "We are well pleased with the results we are getting through the medium of Telegraph Age|"

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General Mention.

The meeting of the New York Electrical Society of February 5 was held on board of the steamship Lusitania on the evening of that date.

A wireless telegraph typewriting machine was on exhibition in Chicago during the two weeks of the Business Show just concluded.

Mr. D. B. Mitchell, a well-known telegrapher, now in other business, in renewing his subscription states: "Your paper is about my only means these days of keeping track of my old friends and associates."

A partridge was recently killed by flying against the wires of the Postal Telegraph-Cable Company in a Connecticut town. Now the authorities are anxious to bring suit against the telegraph company for violation of the game laws.

Mr. John Fitzpatrick, assistant superintendent of the Western Union Telegraph Company, Chicago, Ill., in renewing his subscription for the current year, remarks: "Your paper is always interesting and instructive, and I look eagerly for my copy every two weeks. I wish Telegraph Age the continued success it deserves."

Miss Ella S. Tarr, daughter of W. A. L. Tarr, manager of the office of the Santa Fe railroad telegraph system at Manuelito, N. M., and the night operator at that point, recently started on a vacation of five or six weeks. She will visit a number of points in New Mexico and extend her trip to Denver, Colo.

The New England Telephone and Telegraph Company announces the restoration of a night rate service which was abolished a short time ago. It will apply between the hours of 10 P. M. and 4 A. M. instead of between 6 P. M. and 6 A. M.

Mr. J. B. Coggins, manager, Postal Telegraph-Cable Company, Denver, Colo., has this to say about Telegraph Age: "I have taken the paper for so long a time that it has become a part of the routine of my life, and if it is not delivered on time I feel that I have missed something."

It would have been singular to the telegraph profession of a quarter of a century ago to have had brought to their attention the fact that a telegraph office had been opened on board of a steamship from which messages might be transmitted virtually to any part of the world. Such, however, is a modern realization, for it is announced to telegraph managers that a wireless telegraph office has been opened on board the Italian steamer Duca Degli Abruzzi. The opening of such offices is of daily occurrence. It is also announced to all managers of telegraph offices that messages may be accepted for all steamers of the Mallory and Clyde lines while they are at sea.

Sir Robert Ball, writing in the Home Messenger, remarks that if a row of telegraph posts, 25,000 miles long, were erected around the earth at the equator and a wire were stretched upon these posts for this circuit of 25,000 miles, and that then the wire would be wound no fewer than seven times completely about this great globe, we should then find that an electric signal, sent into the wire at one end, would accomplish the seven circuits in one second of time. To telegraph, however, to the nearest star it would take four years before the electricity would reach its destination. Sir Robert must have burned the midnight oil when he evolved these compilations.

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$1.50 a year.

The Serial Building Loan and Savings Institution, 195 Broadway, New York, has stood a bulwark of strength for years as the telegraphers' friend, faithfully caring for deposits and in providing homes on advantageous terms. It has performed a two-fold mission without flaw or blemish, and offers its services to all newcomers in telegraph ranks.

Advertising will be accepted to appear in this column at the rate of three cents a word, estimating eight words to the line.

Man who knows the multiplex telegraph thoroughly would like position with railroad; take charge installation and operation; broad railroad experience. Have good position now. Address "BR," care Telegraph Age, New York.

Will buy or sell, in one to ten share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

Rubber Telegraph Key Knobs.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

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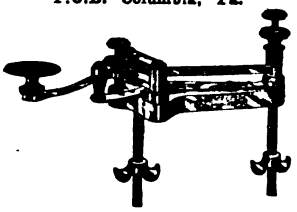

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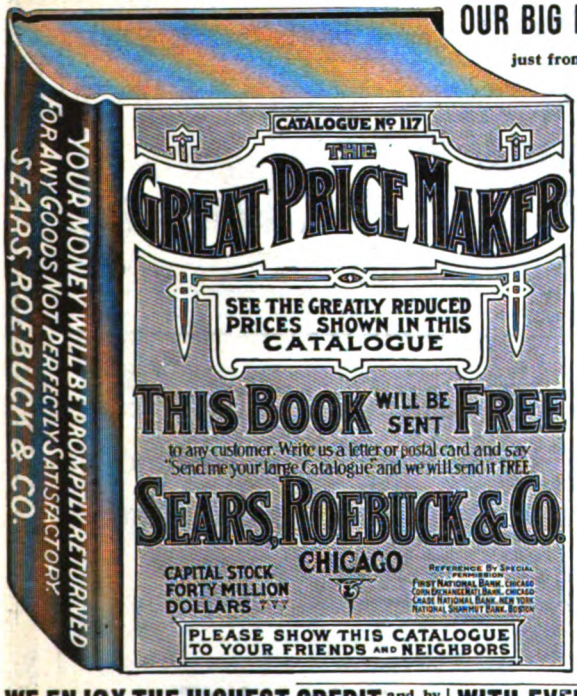

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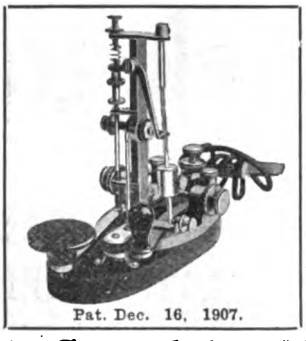

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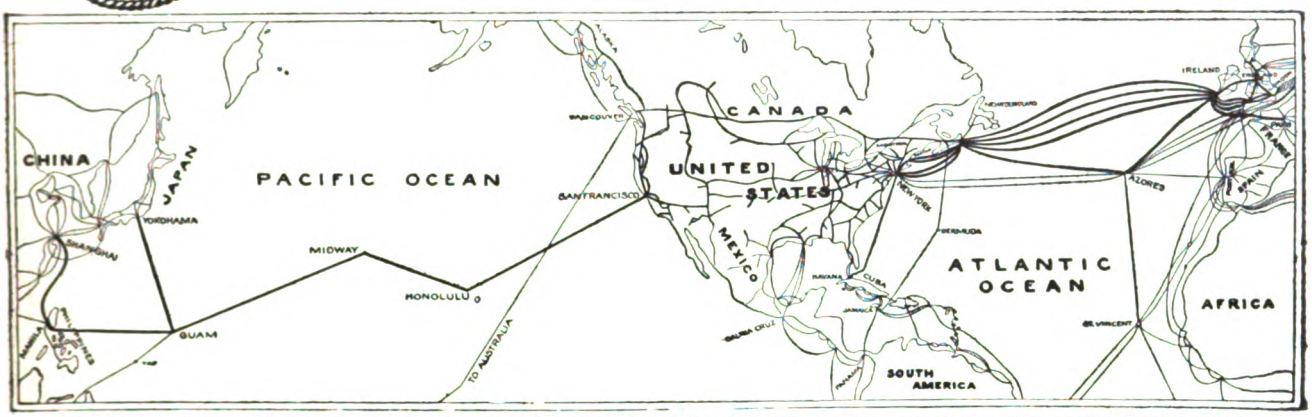

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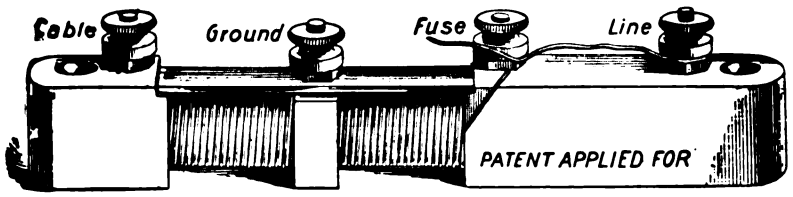

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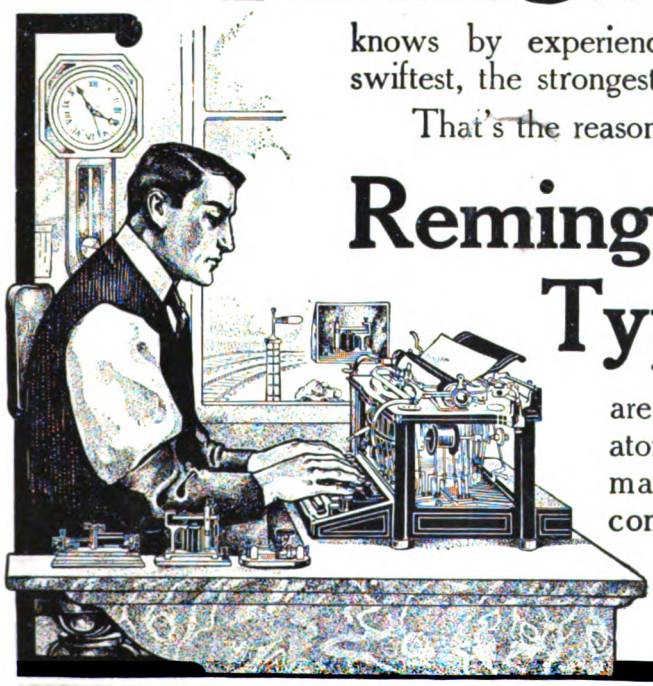

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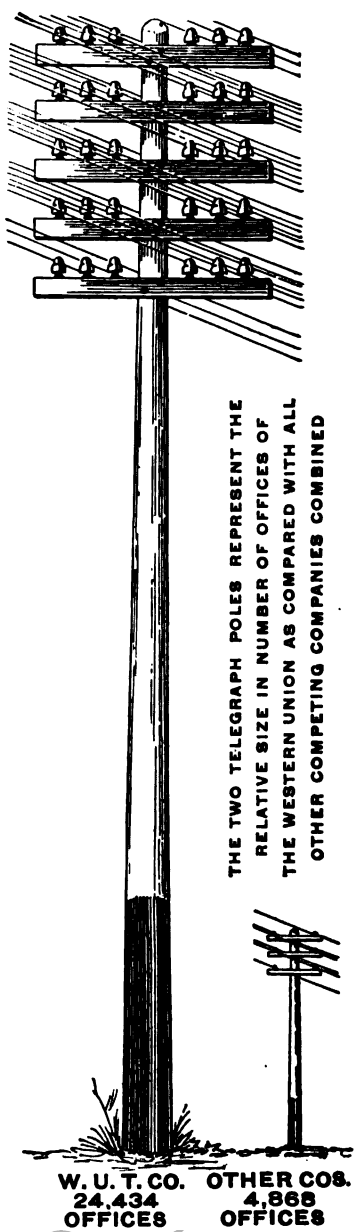

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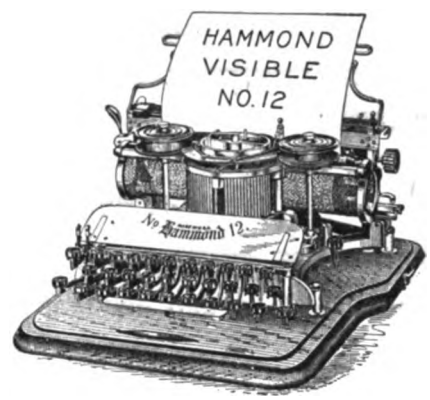

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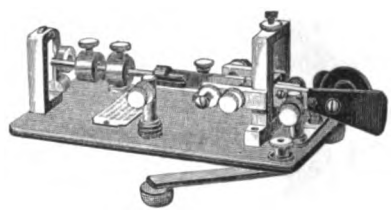

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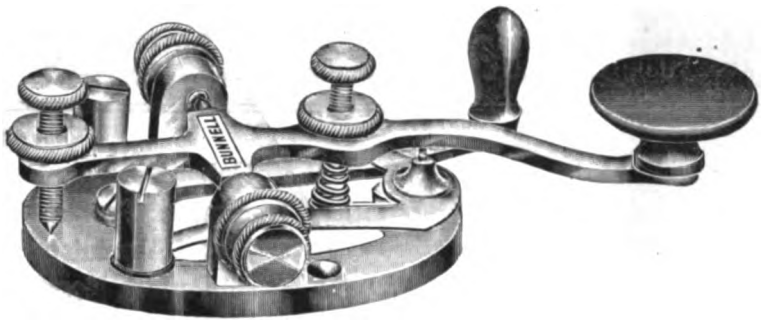

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SOME POINTS ON ELECTRICITY.

How to Become a Wire Chief.

BY WILLIS H. JONES.

Part V.

(Concluded.)

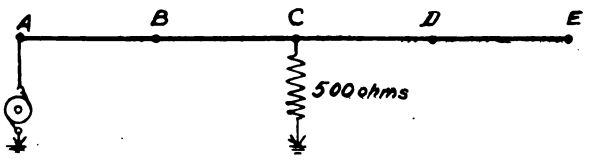
Having described in the preceding installment of this article the usual method of measuring wires for conductivity and insulation by means of the voltmeter, and also by a combination of the voltmeter and ammeter, it is in order to state that the wisdom of endeavoring to determine the actual distance to a ground by dividing the resistance so obtained by the known resistance per mile of the conductor, is somewhat open to question unless extreme precaution is taken.

If the "ground" possesses no appreciable resistance of its own its location will not be far from the point indicated by the computation. If, however, the "ground" is imperfect and possesses a great resistance, its location must obviously be at a point more or less remote from that indicated by the quotient thus obtained. To demonstrate this fact let us, for the purpose of clearness, take an exceptional case. Suppose we have a wire one hundred miles long, the known resistance of which is ten ohms per mile, or one thousand ohms to distant terminal, which is grounded permanently at that point (see accompanying diagram).

Now, if such a wire should be accidentally "grounded" at its middle point, C, with an imperfect earth contact possessing, say, five hundred ohms, the joint resistance of the "ground" and that of the five hundred ohms in the conductor between C and E would be two hundred and fifty ohms. The meter test would indicate that the resistance to such ground was apparently seven hundred and fifty ohms distant, which latter, divided by ten, the known resistance per mile of the conductor, would place the fault at D, seventy-five miles from the testing station, whereas the actual distance is but fifty miles.

Again, in the event that the wire was broken and consequently open between C and E in addition to being grounded, the resistance of the circuit would be one thousand ohms, the same as that of the total resistance of the wire under normal conditions. This would place the "ground" apparently at the distant terminal, fifty miles out of the way.

Of course, where the conditions are such as given in the first example an experienced wire chief would treat it as a very heavy escape and would



probably not attempt to locate it by the method given. But where such "ground" is sufficiently solid to deceive, yet treacherous enough to mislead, it is obvious that the location indicated must be wrong in a measure governed by the resistance of such "ground."

The only reliable way to determine the true distance in miles to such faults is by means of the "Varley test loop methods," described in a previous issue of this journal, or one of the other well-known methods which render the resistance of such "grounds" negligible. As a matter of fact, it is better policy to simply locate the "ground" between two stations in the usual way than bother with the meters. In these days stations are not, as a rule, more than a few miles apart at most. That fact will enable one to locate the fault sufficiently close for the lineman's guidance. The object in calling attention to errors which may result from figures obtained by the formulas given when applied to telegraph circuits is not to depreciate the accuracy of such formulas, but to emphasize the importance of fully understanding the existing conditions in a circuit before using them.

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COMBINATION IRON AND COPPER CIRCUITS.

It seems to be the prevailing opinion among telegraphers generally that a circuit composed of part iron and part copper is for that reason alone necessarily an inferior wire.

No doubt this impression has grown out of the fact that as a rule when a copper wire is patched with an iron wire the efficiency of the original all-copper circuit is reduced owing to the greater resistance of iron as a conductor of the current. Also, for the reason that as iron wires are fast becoming obsolete for telegraphic purposes the present wires used in such patches are usually old and full of high resistance due to rust and joints from numerous repairs. The mere junction of iron and copper in itself should make no appreciable difference provided the total resistance of the circuit thus patched is not altered. In fact a circuit may be actually improved by the combination should the iron portion substituted happens to be a big four-gauge conductor and possess less resistance than the copper length it replaces.

The question may be disposed of by the statement that whenever a wire is patched with a conductor that is better than the portion thrown out, the circuit will be improved. If the substitute is inferior the efficiency of the circuit will be less. The consistency of the conducting wire has nothing to do with it. It is a question of ohmic resistance and insulation.

HOW TO DETECT THE PRESENCE OF A REPEATER IN A CIRCUIT—THE EFFECT PRODUCED BY THE PRESENCE OF MAGNET COILS IN MULTIPLEX CIRCUITS.

After the broker offices close for the day it is customary to restore their wires to regular service. Such wires, as a rule, are worked single in order to include intermediate or side-line stations. For this reason as well as others many leased circuits are equipped with repeaters at one or more points. When such is the case, before the wires can be restored to multiplex circuits the repeaters and all single-line relays must first be removed. The relays if allowed to remain in circuit will create a static "kick" on the multiplex apparatus which is difficult to eliminate. If a relay is near the middle of the circuit it is not always absolutely fatal to the operation of the duplex, though necessarily harmful, but one relay alone inserted near the terminal battery, say, at the main wire switchboard, will in nearly every case make it impossible for the quadruplex attendant to compensate for the kick created by the coils. The condenser will seem to supply alternately, either too much or too little compensating energy regardless of which side of a given point a peg is moved. When a condenser acts in this manner the presence of a forgotten relay in the circuit should at once be suspected.

To determine whether a repeater is still connected in a leased circuit where the repeating station cannot be raised promptly, ask the terminal station to ground the wire in his switchboard, and then ground the home terminal in the same manner. If the wire then shows no appreciable trace of current it is safe to conclude that the repeater has been removed and the wire cut through straight. If, however, each terminal feels an incoming current under these circumstances the repeater is undoubtedly still intact, as each terminal will get a current from the repeater station.

(Concluded.)

In describing the formula $X = V R \left(\frac{E}{E'} - 1\right)$ in the previous article of this series, issue of February 16, a better way perhaps to convey a clearer meaning of a definition of the factors E and E' would be as follows:

E = the deflection of the voltmeter needle when the connection with the battery is made, as in Fig. C, or the "first reading."

E' = the deflection when the connection is made as in Fig. D, the Vm being in series with the line.

While discussing this subject it is well to explain that from results obtained by the first

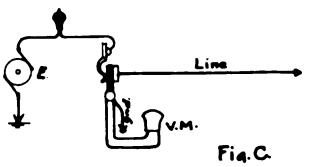

Fig. C.

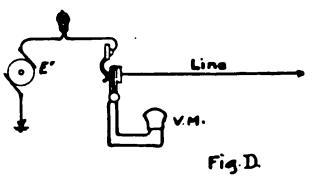

Fig. D.

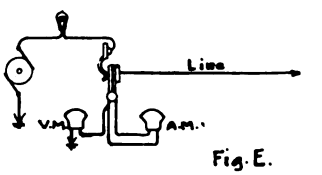

Fig. E.

formula the resistance of the battery, or dynamo lamp resistance, approximately two ohms per volt, should be subtracted from the result.

At the same time the last paragraph of the same article, referring to the formula $\frac{E}{C} = R$, may also be made clearer by a reference to the accompanying diagram, Fig. E. In this case the readings of the Vm and Am are taken simultaneously, while the full volume of current is flowing, and as the voltage is taken at a point between the lamp and the line the resistance is eliminated from the calculation.

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Recent Telegraph Patents.

A patent, No. 877,914, for a telegraphic transmitter, has been granted to Patrick B. Delany, of South Orange, N. J. The local battery circuit contains two electromagnets so arranged that when one is energized its armature closes the circuit of the second and the armature of this one then opens the circuit of the first. The local magnets thus send a succession of impulses over the line.

A patent, No. 877,915, for a telegraphic transmitter, has been awarded to Patrick B. Delany, of South Orange, N. J. A counterbalanced circular oscillator is set in motion by the key lever and in turn governs contacts so as to send a series of dots over the line automatically.

A patent, No. 878,963, for telegraphy, has been taken out by Isidor Kitsee, of Philadelphia, Pa. In telegraphing with true reversals the transmission line has a main battery and each station is equipped with a local battery, a transmitting key, a polarized receiving instrument and means to connect the line either directly or with the interposition of the local battery to the key.

A patent, No. 879,963, for telegraphy, has been issued to I. Kitsee, of Philadelphia, Pa. Arrangement for telegraphy over lines of comparatively large capacity.

The following patents have expired:

Patents Nos. 446,424 and 446,425, for a system of telegraphy, held by R. G. Brown, of Brooklyn, N. Y.

Personal.

Lee De Forest, of wireless telegraph fame, was married, on February 25, to Miss Nora Stanton Blatch, the daughter of Mrs. Harriet Stanton Blatch, and granddaughter of the late Mrs. Elizabeth Cady Stanton.

Sir William Van Horne, of Montreal, chairman of the board of directors of the Canadian Pacific Railway, the well-known old-time telegrapher, was in New York a few days ago, subsequently sailing hence to Europe.

Oscar Moll, general manager of the Deutsch-Atlantische Telegraphengesellschaft, of Cologne, Germany, in renewing his subscription recently to this journal took occasion to say: "We have been very pleased to notice the contents of Telegraph Age, which has been improving from year to year, and consider it one of the best educational papers for telegraphers and electricians. We shall not fail to recommend it when occasion requires."

The sixty-first birthday of Thomas A. Edison was celebrated on the evening of February 11, in Newark, N. J., by a dinner tendered him by members of his staff. It was an informal affair, and all the more enjoyable on that account. William E. Gilmore, general manager of the various Edison interests, presided as toastmaster, and in proposing a standing toast to Mr. Edison, said: "Let us drink to the 'Old Man,' as we lovingly know him—to your very best health, sir."

E. T. Moore, Western Union Manager at Memphis.

Edward T. Moore, who, as previously announced, has been appointed manager of the Western Union Telegraph Company at Memphis, Tenn., where he succeeded W. A. McKeever, resigned, is a type of that portion of the younger element in the service who, endowed with intelligence and resolute with commendable purpose, are showing diligence and application in their work. Such men are in demand and are bound to win success. Mr. Moore was born at Belleville, Ill., August 9, 1875. He entered the telegraph

EDWARD T. MOORE.
Manager Western Union Telegraph Company, Memphis, Tenn.

business in the employ of the Postal Telegraph-Cable Company at a branch office in Denver, Colo., in November, 1892, afterwards serving the same interests as an operator at Colorado Springs. In October, 1893, he entered the Western Union service at Anaconda, later returning to Colorado Springs and Denver. As an operator he developed quickly and became expert at the key. He was a close observer and student. At the same time he showed qualities of executive ability which resulted subsequently in his being selected for positions of managership. These were filled in sequential order at the following points: Creede, Victor and Cripple Creek, Colo.; Albuquerque, N. M.; Boise, Idaho; Salt Lake City, Utah; Boulder, and Leadville, Colo., Vicksburg, Miss.; Lexington, Ky., and Knoxville, Tenn. From the latter place he was promoted to the Memphis office on January 8.

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EXECUTIVE OFFICES.

Mr. John C. Barclay, assistant general manager and electrical engineer of the company, is absent on a tour of inspection in the west, and will visit its principal cities.

Horace E. Roberts, superintendent of supplies, was in Chicago last week on business connected with the service.

J. W. Reed, manager of the Philadelphia office, was raised to the third degree of Masonry on February 18. Numerous telegraph friends were present on the occasion to witness the ceremony.

A son was born to Mr. and Mrs. Ralph E. Bristol on February 18. Mr. Bristol is the storekeeper of the company in this city, and is the son of Charles H. Bristol, general superintendent of construction.

The company is equipping a new office in Springfield, Mass., into which it will remove April 1.

The Barclay printer continues to demonstrate its usefulness, meeting all demands and fulfllling all expectations. It is being installed as rapidly as circumstances of manufacture will permit. The following comprise all circuits now equipped with this printer: Six between New York and Chicago; two, New York-St. Louis; three, New York-Boston; three New York-Philadelphia; two, New York-Pittsburg; two, New York-Buffalo; one, New York-Washington; one, New York-Cleveland; one, New York-Atlanta; one, Philadelphia-Pittsburg; one, Philadelphia-Boston; one, Buffalo-Boston; one, Buffalo-Pittsburg; one, St. Louis-Kansas City; two, St. Louis-Chicago; one, Chicago-Boston; one, Chicago-Pittsburg; one, Chicago-Buffalo; one, Chicago-Philadelphia; one, Chicago-Cleveland; two, Chicago-Kansas City.

The American District Telegraph Company, of Washington, D. C., has been incorporated under the laws of Virginia, with a capital stock of $10,000. Robert C. Clowry, George H. Fearons, Belvidere Brooks, John C. Barclay, C. F. Patterson, of New York, and J. P. Altberger, of Philadelphia, are the incorporators.

RESIGNATIONS AND APPOINTMENTS.

George H. Nicoll, manager at Council Bluffs, Iowa, has been promoted to the position of chief clerk in the office of J. C. Nelson, superintendent at Omaha, taking the place of H. M. Goulding, who has retired to engage in other business. Succeeding Mr. Nicoll in the Council Bluffs office is O. T. Welch, who has been employed in the Omaha office. Mr. Nicoll has been in the employment of this company nearly thirty years.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Jesse Hargrave, superintendent at Birmingham, Ala., was in town a few days since, coming north for the purpose of removing his family to his new southern home.

Mr. E. W. Collins, superintendent at Cleveland, O., has so far recovered from his recent protracted illness as to be able to spend a portion of each day at his office.

Mr. W. H. McCollum, formerly superintendent of construction, New York, now attached to the office of vice-president Charles C. Adams, is ill with pneumonia at Gallup, N. M., whither he had gone on business connected with the service.

Manager F. F. Norton, of the operating department, who has been ill, is once again at his desk.

The Commercial Union Telegraph Company held its annual meeting at Portland, Me., on February 12, when the following officers were elected: Edward J. Nally, president, and Charles P. Bruch and Charles C. Adams, vice-presidents, all of New York; Clarence C. Ramsay, secretary and treasurer, of Portland. The report showed the company to be in good condition.

F. W. Sprong, cashier of the office at Cincinnati, has been appointed manager, vice C. E. Sawtelle, resigned to enter other business. Mr. Sawtelle was regarded as one of the brightest men in the telegraph business. Mr. Sprong filled the position of cashier for two years, and for twenty-three years has been a faithful employee of the company.

The Government Wireless Telegraph System in Alaska.

General James Allen, chief signal officer of the army at Washington, in a letter to Telegraph Age, dated February 25, respecting the extension of the government wireless telegraph system in Alaska, writes with much detail of statement, as follows:

"It will probably be of interest to the readers of Telegraph Age to know that a wireless system is contemplated in Alaska with which it is hoped that wireless communication can be maintained between Nome, on the western coast of Alaska, and the following stations: Fort Gibbon, Circle City, Fort Egbert, Fairbanks and thence to the proposed naval stations at Valdez, and at Dutch Harbor on Unalaska Island in the Aleutians. It is hoped that the chain of naval stations—Valdez, Sitka and Cape Flattery—will connect the Alaskan system with the United States.

"The stations at Nome and Fort Gibbon will be of ten kilowatt power, while the stations at Fort Egbert, Circle City and Fairbanks will be of three kilowatt. The naval stations at Valdez, Dutch Harbor and Sitka will be probably even larger than either of the sizes named.

"The distance from Nome to Fort Gibbon is approximately the same as that from Fort Gibbon to Valdez, namely, 450 miles, while it is thought that Fairbanks, Circle City and Fort Egbert will be within easy communication with the smaller power stations, as the distances are not over one hundred and fifty miles. These

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stations will not only serve as alternatives to the existing land and cable lines in case of breakdown of the latter, but they will also be useful to establish wireless communication by means of smaller stations at various mining camps within the range of their operation. The station at Dutch Harbor, in the Aleutians, is within comparatively close range of all ships passing between San Francisco or Seattle and Japan, at the most northerly part of the Great Circle route.

"The Signal Corps wireless sets on the transports between San Francisco and Manila are of only three kilowatt power, but on at least one occasion they have operated over a distance of 2,200 miles with Sitka, and it is stated that they expect usually to open communication with the Mare Island station at San Francisco when within 1,000 miles thereof."

The Cable.

Cable communication was interrupted February 26, with:

Venezuela	Jan. 12, 1906.
Hayti	Jan. 18, 1908.
All offices closed to International traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.	
Ahvaz, Persia	Jan. 26, 1908.
Messages must be addressed "Ahvaz, Post Bushire," until further notice.	
Madura Island(Dutch East Indies)	Feb. 3, 1908.
Sitka-Valdez cable interrupted	Feb. 14, 1908.

No less than fifty vessels are constantly employed in repairing the submarine telegraph cables of the world.

A Reported New South American Cable Project.

The story published in the Financial News, London, on January 30, to the effect that a new South American cable under Reuter auspices, and to be laid by the India Rubber, Gutta-Percha and Telegraph Works Company, Limited, is denied so far as the latter company is concerned as unauthorized and incorrect. The story as printed stated:

The prospectus is in circulation of the Caribbean Anglo-Colombian Cable Company, Limited, which states that it has acquired the exclusive privilege—granted by the government of the Republic of Colombia for the period of fifty years—for the laying and working of submarine cables, or any other means of telegraphic communication between the Atlantic coast of Colombia and any point situated outside its jurisdiction already supplied with telegraphic service. Under this concession the India Rubber, Gutta-Percha and Telegraph Works Company, Limited, will at once proceed to lay a cable between Puerto Colombia (Savanilla) and Kingston (Jamaica). At this latter point it will connect with the lines of the Direct West India Cable Company, Limited, with whom it is added that favorable working arrangements have been made.

The concession carries with it the guarantee by the Colombian government of a half-yearly income of £14,384, payable monthly. It appears, moreover, that the India Rubber, Gutta-Percha and Telegraph Works Company, Limited, have agreed to provide the company with the amount necessary to make the two first payments in respect of the interest on the first and second debenture stock and the sinking fund for the redemption thereof, and to make certain other payments to the company, so that the due service of the debenture stock during the period of construction is likewise assured. The concession also confers on the company the right of establishing, in agreement with the Colombian government, telephone lines from Bogota to Medellin, via Honda and Manizales, and from Manizales to Cali, via Cortago and Palmira, and to put these towns in communication with other places in the Republic. The government has undertaken to transmit free of charge, by its telegraph lines, all cables sent from abroad to places in the Republic in communication with such lines and vice versa.

The Caribbean Anglo-Colombian Cable Company, Limited, is to have a capital of £200,000, divided into ordinary shares of £1 each. There will also be £110,000 six per cent. first mortgage debenture stock and £50,000 six per cent. second mortgage stock. The directors of the company are stated to be: Baron George de Reuter, director of Reuter's Telegram Company, Limited; Albert Pam, director of Marmite Food Extract Company, Limited; Hon. Arthur Stanley, M. P., director of Buenos Aires and Pacific Railway Company, Limited, and Francis Minchin Voules, alternate director of the Para Electric Railways and Lighting Company, Limited, all of London.

It would appear that the carrying out of such a scheme as here presented would be a direct violation of the rights accorded to the Central and South American Telegraph Company by the Colombian government. When the information relative to the proposed new company reached Mr. Scrymser, president of the Central and South American Telegraph Company, he sent the following cablegram to the India Rubber, Gutta-Percha and Telegraph Works Company, at London:

Your memo January 31 received. Fernandez agreed sell his concession to our company for ten thousand pounds subject condition he have large rakeoff annual subsidy for collecting same from government. Consider payment subsidy extremely doubtful because interest Colombian government bonds reported in arrears and several subsidized Colombian railroads have prior lien of Colombian Custom House receipts. Note fifty cents is rate over cable. Colombian traffic never exceeded sixty six thousand dollars a year. Communication will be dependent on single cable from Savanilla to Halifax and no repair steamer on line. Have notified Colombian government if it discriminates against our company via Buenaventura company will close office there. Colombian government assures company Bogota Buenaventura line will be maintained and there shall be no discrimination. If we should make Colombian rate fifty cents Caribbean company would have to rely exclusively on doubtful subsidy for income. Am surprised that men of prominence should support such speculative scheme as Caribbean company.

The English Telegraph Construction Bill provides that, where a landowner refuses to give consent to the placing of telegraph poles along the high road, the postmaster-general may appeal to a county court judge and the railway commission. Power is also given to the postmaster-general to carry wires over the corners of fields and to lop trees which interfere with the lines, and he may, by provisional order, gain access to land barred by an unreasonable landowner.

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The Telepost System.

Patrick B. Delany, the well known telegrapher and inventor, read a paper before the Franklin Institute, Philadelphia, on January 15, last, in which the telepost system of automatic or machine telegraphy, the invention of Mr. Delany, was discussed at length. He said in part:

"As you all know about the ordinary Morse system, comprising the relay, sounder and key, it will be easy to understand the modifications by which it is proposed to improve Morse working, to the extent of quadrupling its present message capacity, whether the wire be used for simplex, duplex or quadruplex transmission. In these days it is hardly worth while, however, to include the Morse quadruplex in any practical estimate, as its day is about done, owing to increasing underground construction and inductive interferences from power wires. Wherever operable, however, the ratio of gain will hold.

"The president of the Western Union Telegraph Company stated publicly last April that ninety-nine per cent. of the messages handled in this country were still transmitted by the old-fashioned Morse key, at a speed averaging seventeen messages an hour, and stated also that this was considerably less than the speed of several years ago. Allowing thirty words for each message, including address, date and signature, this shows an average of nine words per minute per circuit. Thus it seems that while the transfer of energy over a wire in another department of electricity has been increased from a few hundred volts to seventy-five thousand within the last twenty years, the transfer of words has fallen off during the same period, and is now about one-fortieth of what a wire is able to convey.

"Up to a few years ago there was strong opposition on the part of telegraph companies to the preparation of messages on tapes preliminary to their transmission, but it is now conceded that in no other way can the speed of a circuit be appreciably increased, and the perforated tape is coming into use even for unimportant advances in telegraphy.

"Four operators may be employed in perforating tapes by Morse key at the rate of twenty-five words per minute each, and the product of their united work sent through the mechanical transmitter and reproduced on a perforated tape at the distant station. This tape is then distributed among four local circuits where a perfect reproduction of the original characters are ticked off on the sounder and copied on the typewriting machine by the operator, just as if the characters were coming over the wire from the operator's key direct. As a matter of fact, the original manipulation of an operator in preparing the message is greatly improved by the perforating process, since all impulses, whether regularly or imperfectly made by the operator's key, make the same sized hole in the tape. The impulses over the line must therefore be all uniform. Of course, the variations in length of dashes or spaces will be faithfully duplicated on the receiving tape, but the evenness of impulses passing over the line from the uniform perforations greatly improves the general quality of the work. Obviously, the original preparation of the message and the transcription by sound may be carried on at any rate that the operator is capable of perforating or reading by sound. For instance, a keyboard Morse transmitter can be used for perforation at fifty words per minute, there being no interruptions incidental to a line, and no operator at the distant end to limit manipulation by the perforating operator. Similarly, the operator reading by sound from the reproduced tape at the receiving station may regulate the speed of his tape to any speed that he is capable of reading and working his typewriter, and may confirm any doubtful word by looking at the perforation. Of course, transcription may be done by reading from the tape direct by those not proficient in reading by sound.

"An inexperienced operator at some way station may perforate ten words per minute, the message goes over the line at 100 words per minute, and is transcribed by sound, locally, at the receiving station at twenty-five words per minute. Ordinarily, if this message was sent directly over the line the entire use of the wire would be monopolized by the slow operator.

"For through business, New York to San Francisco, for instance, a tape can be reproduced in Buffalo and used for retransmission into a Chicago circuit, where another reproduction can be used for transmission to Denver, then again reproduced at Salt Lake, and finally at San Francisco, at one hundred words per minute, as against an average of about twelve words by the present Morse method, using five or six automatic repeaters. Instead of perforating tapes, repetition may be effected by the movement of the perforating levers, or perforation and repeating may be done simultaneously at any station. Duplexed, this system would yield two hundred words per minute in perfect Morse, and without the slightest deviation from the regular Morse method, the sender working his key, and the receiver copying by sound, while the message capacity of the duplexed wire is increased from about forty words per minute to two hundred.

"A most important application of this system will be for the distribution of press news. Drop copies can be made at one hundred words per minute at thirty or forty way offices, either perforated on a tape for operation of a local sounder at any speed desired, or recorded in plain dots and dashes for deliberate transcription by those who cannot read by sound. A linotype operator knowing the Morse code will be able to compose directly from the tape. The reproduced perforated tapes may be used for re-transmission over other circuits, so that a news despatch perforated in New York may be distributed all over the coun-

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try, and newspapers now too poor to buy press matter may be supplied at a nominal charge.

Coming now to the system of rapid automatic telegraphy or the "Telepost," which records one thousand words per minute in plain Morse characters, the electrostatic capacity of a line is its capacity to hold current, and this capacity has to be satisfied before a signal can be manifested at the distant station, and the charge left in the wire after the signal has been delivered must be discharged to ground or neutralized by a reverse current before another signal can arrive. The electro-static capacity of a wire is increased by its envelope, whether it be air, or insulating material. The static discharge after each impulse runs out at the ends of the wire, about two-thirds coming back to the sending station, and one-third following the signal impulse on to the receiving station. The portion coming back is an obstacle in the way of the next signal, and the portion running out has the effect of elongating the signal which it follows, and if the signals are too close together and the wire long enough, they will appear on the recording tape as a solid line without definition, so that letter p, comprising five dots, would look like letter l, which is a long dash. The remedies for this very troublesome obstacle in the past have been transmission of reverse impulses after each signal, so as to neutralize the static discharge in the line, or connecting the line to ground after each signal, so as to let the static run out. Another way was to put artificial leaks or partial grounds at different points along the line and work over them by surplus power. The first of these remedies is the only one that is practically effective, as the static discharge can be neutralized in about one-tenth of the time taken for its discharge to ground.

"In this system three very important factors are combined for obtaining the best result from a telegraph circuit: First, a positive current sufficiently powerful to make the record electro chemically in the shortest possible time; second, a regulable source of electro-static capacity for use where the normal capacity is not enough to make a dash; third, adapting the power of the negative current to the electro-static capacity of the line, normal, or artificially augmented, to give the record the maximum plainness consistent with safe separation of the characters, so as to make transcription easy and accurate.

"It is thought that in this organization is reached the highest signaling efficiency for all conditions of lines, overhead, underground, long or short. There are no electro-magnets to energize, no armature to actuate, no inertia to overcome, or electro-mechanical work to do. The chemically prepared tape is a part of the circuit, and the characters are made simply by the current passing through it. Once installed on a line, there is practically no adjusting to do. A change in weather conditions sufficient to put out of operation any electro-magnetic system does not seriously interfere with the electro-chemical. Half the current might be suddenly diverted during transmission without loss of any of the characters. The record would be fainter, but no impulses would be missing.

"The system can be superimposed on a telephone circuit and worked simultaneously with telephony at about two-thirds of its independent speed.

"While our time has been taken up altogether with the main electrical methods, it may be said that there are numerous features of operation and control which are indispensable for practical commercial telegraphy. The demonstration will show that as the tape bearing the message comes from the perforator it is automatically wound upon a reel, and whether there be one or a dozen messages, or 500 words of press, the tape is a single unit, and goes through the transmitter last and first.

"At the receiving station, the tape is also wound upon a reel which brings it right end first—for transcription. The received tape is drawn in plain view of the transcribing operator by means under his own control, not continuously moving, but in fixed stops, so that it is at rest while being read. The receiving machine is under control of the transmitting station. When the transmitting lever is put down to start the tape, an impulse is sent which starts the receiving tape. When the transmitting tape runs out another impulse is automatically sent which stops the receiving tape. Should the receiving operator wish to stop the transmitting machine he can do so, and the transmitting operator can stop the receiving machine at any stage. Should the wire come accidentally in contact with another both machines would be thrown out of operation.

"It is only by the utilization of the full facilities of a wire that a telepost service can be established. Cheap rates are impossible at nine words a minute. At 500 to 1,000 words per minute the charges can be brought to apply to ordinary correspondence now sent by rail. When a letter of fifty words filed in the telepost office in Philadelphia can be dropped in a post office in Chicago or any other city within half an hour for twenty-five cents, an enormous traffic will be speedily developed. It will be entirely feasible for business houses or newspaper correspondents to compose their letters or reports on a tape in their own offices by keyboard machine, send the tape in a roll to the telepost office, where it will be forwarded without delay, and have the record tape delivered to the party at the other end, for private transcription. In this way correspondence would be absolutely private, for, if desired, the perforated tape could be returned to the sender. Here the telegraph toll would be merely nominal.

"There is nothing now between the high-priced telegram and the two-cent stamp, of which over one hundred millions of dollars worth are used yearly. The argument of the telegraph companies has been that telegraphing is an emergency business. People only use it when compelled to

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and then are willing to pay the price. This position is in strong contrast with every other art or industry, and must surely give way to a more enterprising policy, and all correspondence of any importance whatever will be telegraphed. Words will go by wire instead of by train. To restrict the use of a wire by working it at from nine to forty words a minute when it is capable of carrying one thousand words, is wasteful.

"To put a letter in a bag, cart it to the train, haul it a thousand miles, and then cart it to the post office, is slow. Between those two methods of communication it is thought there is room for the Telepost."

[During the lecture one hundred words per minute were transmitted from a perforated tape and reproduced in perforations at the receiving end of a five hundred-mile artificial line. The received tape was then run through a local sounder circuit, yielding perfect Morse at speeds ranging from ten to sixty words per minute. Over the same line by the rapid automatic or "Telepost" system one thousand words per minute were plainly recorded in Morse characters on a chemical tape.]

The Railroad.

In addition to the recent taking over of the Lake Erie and Western telegraph line by C. S. Rhoads, of Indianapolis, superintendent of telegraph of the Big Four road, as already announced, the telegraph system of the Cincinnati Northern has also come under the same jurisdiction, effective March 1. Heretofore these lines have been under the supervision of the Lake Shore and Michigan Southern.

A decision by the Interstate Commerce Commission was made on February 17 on the application of the Georgia Southern and Florida Railway Company for an extension of time to comply with the law. The commission held it had no jurisdiction but to enforce the law. The company sought permission to work operators overtime in ten wayside stations, but the commission held there is no showing that other telegraphers could not be obtained, and the request was denied.

In reference to the report recently made by the operating vice-presidents of railroads that the so-called nine-hour law relating to the employment of train despatchers, telegraph operators and tower men, be suspended, the interstate commerce commission makes the announcement "that 'good cause' for extension is not shown when it is merely alleged or made to appear that the law ought not to be enforced at certain stations or classes of stations because the train orders handled is small and there is no need of increasing the force of employees. Neither would it be good cause, as we believe, to show that additional operators cannot be obtained at the wages now or heretofore offered, if it appears reasonably certain that higher wages would procure the requisite number."

Experts who testified at the recent hearing before the Wisconsin Railroad Commission on the eight-hour law expressed themselves as very much in favor of the use of the telephone for despatching trains. The testimony indicated that nearly every large railroad in that state is now using a telephone system to at least a limited extent in handling its trains. In some cases the telephone has been recently installed and is considered simply an experiment. Reference was made to the successful operation of the plan on the Chicago, Burlington and Quincy road between Aurora and Mendota during a six months' trial, as a result of which the system will be extended. It will be recalled by telephone men that some railroad men have for a long time argued that the telephone was not safe, but at this hearing W. W. Ryder, superintendent of the traffic department of the Burlington road, said positively that the telephone is as safe, if not more so, than the telegraph in the transmission of messages regarding the moving of trains. Confirmation of this opinion from numerous other railway men of experience and authority was heard by the railroad commission.

The next meeting of the Railway Telegraph Superintendents, the twenty-seventh annual reunion of that body, is scheduled to be held at Montreal, Que., on Wednesday, Thursday and Friday, June 24, 25 and 26. The Windsor Hotel has been selected as headquarters. This will be the first convention to occur in Canada since that of 1895, thirteen years ago, and it is hoped that a large number of the railroaders will be in attendance at a time which promises to be not only one of importance in respect to the subject matter coming up for consideration, but also as affording an opportunity for a demonstration of Canadian hospitality. The officers of the association are E. P. Griffith, New York, superintendent of telegraph of the Erie Railroad, president; W. J. Camp, Montreal, electrical engineer of the Canadian Pacific Railway's Telegraph, vice-president, and P. W. Drew, Chicago, superintendent of telegraph of the Wisconsin Central Railway, secretary. Mr. Camp is at the head of the committee of arrangements. The committee on topics, consisting of J. L. Davis, Chicago, superintendent of telegraph of the Chicago and Eastern Illinois, chairman; E. Parsons, Chicago, assistant superintendent of telegraph of the Illinois Central, and Percy Hewitt, Houston, Tex., superintendent of telegraph of the Sunset Route, are busily engaged in arranging for papers to be read and discussed at this meeting.

It will be noted that the address of P. W. Drew, the secretary, is now at Chicago, instead of at Milwaukee, as formerly, headquarters being recently changed.

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progressive operator; $1.50 a year.

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Important Subjects Treated in Back Numbers.

TELEGRAPH AGE has published the best articles on telegraphic subjects that have ever appeared in print. Herewith are enumerated a few of the most important subjects treated, together with the date of the papers containing the same. Copies of these back numbers may be had at twenty-five cents apiece upon application. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

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Wheatstone Bridge, F. W. Jones .....Nov. 16, 1906
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Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26, 1908.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Railway Signal Association will meet in 1908 at a date and place to be named later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., in 1908, at a date to be named later.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers' Association meets at Fort Worth, Tex., on June 18, 1908.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

The influx of new men in the telegraph service has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is $1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

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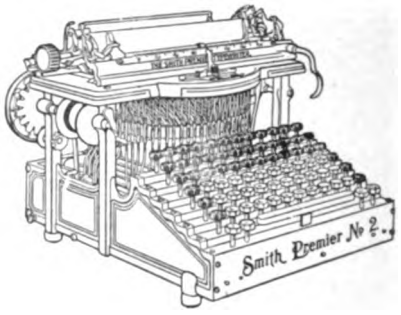

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NEW YORK, MARCH 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Unfair Journalism and the Telegraph.

A great deal of cheap information, furnished under the guise of news, at once misleading in character and mischievious in its tendencies, is being disseminated from Washington and sent broadcast over the land. Some correspondents, news bureaus or syndicates, be it observed, charged with the responsibility of news gathering, are prone to take advantage of the prevailing temper of the times to write with flippant pen and thought respecting the important questions now agitating the people relative to the industrial well-being of state and nation. All industries come under impartial yet superficial consideration and review. Nothing is spared; nothing is too deep, too profound or too sacred in its broad and vital relationship to the body politic to warrant serious treatment, or escape vitiating touch. The welfare of the nation, its troubled business conditions, appear in no wise to create consideration of or responsibility for utterance; the existing situation seemingly only affording a subject to be seized upon with avidity, a ready and convenient source of supply for the production of so much space matter.

Disguised frequently under expressions quoted as coming from unnamed yet "well known" Congressmen," "Senators" and "public men," opinions sufficiently "yellow" in tone as to arouse just indignation, reflective of viewpoints so low in ethics that properly should condemn its authors to recall and oblivion, this stuff is daily transmitted over the country to find publication and circulation in numerous journals, mainly, it should be said, in the smaller towns, many of whose editors, perhaps because of environment, either have no time or disposition to scan too closely that which they receive.

It is not sufficient to say that material of this nature, emanating as does that referred to, is given as news simply and that the line must be drawn with that understanding. The fixing of such a limit of responsibility cannot be determined by any such code of ethical reasoning. Much of what is published, coming under this head, is distinctly untrue; it is frequently so put as to confuse and mislead the public mind and so create a wrong conception of and prejudice against public utility corporations, the successful operation of which is absolutely essential to the prosperity of the country, a view of the subject which needs to be stated more frequently and with increasing force. The purveying of such news, therefore, as stated, is wrong in both theory and practice. It reflects a moral standard at which we are arriving which can only be depicted as low; for the pharisaical act of endeavoring to appear in the role of the reformer, without any too clear an understanding of the issues at stake, is lamentable.

The influence exerted by the class of journalism that permits its important telegraphic despatches to pass unchallenged, and thus by inference at least, accepting and endorsing the sentiments expressed, is reflected too often, unfortunately, in the trend of much state legislative enactment which the telegraph and the railroads are called upon to encounter. How often do we see it stated that oppressive taxation is directed against the telegraph for the privilege of doing business within municipal, town, county and state boundaries! Are such impositions actuated by motives of extortion, as a means to enforce exclusion, or, what is more likely, urged because of a lack of a correct understanding of the actualities governing the position of the telegraph?

Doubtless, many a legislator if told that the telegraph companies would be unable to stand up under the financial burdens unrestricted taxation would impose, such as are being constantly proposed, under various forms and conditions, but would seriously question the truth of the statement. Yet of its verity there can be no dispute.

Labor representatives cannot aid their cause by wilful and ridiculous misrepresentations re-

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specting the telegraph, statements which too willing correspondents frequently lend themselves as a ready medium of communicating to the reading public.

The telegraph as a commercial factor and as a civilizing force making for the weal and not the woe of the people, is deserving not of repressive measures that would curtail its usefulness, but those that lend encouragement and make for prosperity and not loss. Criticism there may be when needed, government control also (not ownership) if that be deemed essential in the light of modern ethics, but harassment never; that should cease. A clearer vision based on knowledge of telegraphic affairs, easily accessible, is sorely needed. Were a spirit of fairness, of equity and sanity of judgment exercised, the telegraphic situation might be measurably lightened and improved to the probable satisfaction of all concerned. Sobriety of thought and action respecting the telegraph should succeed rashness of demand and purpose.

The Need of Postponing the Operation of the Nine-Hour Labor Law.

It is announced that the Interstate Commerce Commission will take testimony as to the need of action by the commission postponing the day on which railroads shall comply with the law limiting the working hours of telegraphers and signalmen. This law goes in effect March 4, unless the commission shall issue an order modifying it. The proviso giving power to the commission in this respect applies only to these classes of employees (not to trainmen) and the commission has issued a notice holding that the proviso is extremely limited. It is believed to apply only in exceptional instances of unusual conditions which could not have been foreseen. Conditions common to many railroads cannot be deemed "a particular case" for relief by the commission. The fact that business is small at a given station can have no weight; neither can the commission accept testimony as to a scarcity of operators, if it appears that higher wages would secure as many as are needed. The commission cannot postpone the taking effect of the law because compliance will be inconvenient or costly, nor can a suspension be ordered after the law has taken effect. It has been given out in the newspapers, though not in a formal statement, that the commission has received thousands of telegrams informing it that operators are plenty. As these telegrams seem to have had their inception in a request sent broadcast by an officer of the Order of Railway Telegraphers, and as no evidence is adduced to support the statement as to the number of operators available, it remains to be seen how much force it should have. In his telegram to the commission one of the operators said that "10,000 telegraphers were being turned away by the railroads," and he pleaded that "the law should remain as it stands for humanity's sake." It is greatly to be regretted that this law was not subjected to a little more rational discussion before its terms were crystallized. "Humanity" would be much better subserved by the application of more rational methods of improvement to the telegraph and signal departments of most of our railroads, than by a "strike law" which gives some men too little work and to others allows too much. There is evidence a-plenty that in Maryland, when an eight-hour law for telegraphers has been in force for a year or two, the change has done little or nothing to promote increased safety, while some of its results have been demoralizing, as where a man works eight hours a day for one company and another period of eight hours for another. In putting such a strict construction on the law the Interstate Commerce Commission seems to be only following the policy which it has adopted with rate and tariff questions and all other points which have arisen since the amendments of 1906 were passed; and the strict construction would seem to be one which the courts would be likely to sustain. But to appeal to Congress for a modification will probably be as futile as were the appeals for more rational treatment of the question a year ago.—The Railroad Gazette.

Operation of the Railroad Telegraph Law in Wisconsin.

The enactment by the previous Wisconsin legislature of a law forbidding any railroad company employing any telegraph operator for a longer period than eight hours a day has resulted in cutting off more than fifty communities in that state from telegraphic service. When the law went into effect the first of the present year, the railroads, in order to meet the new conditions it brought about, cut out entirely the telegraph service at a large number of local stations. In come of these places telephones were installed for the purpose of "blocking" trains.

A storm of protest arose from all over the state and complaints of an informal but vigorous nature were received by the state railroad commission. A hearing was held for the purpose of getting information, and as the result the commission has issue a review of the testimony, and decided that the companies have a right to close all the telegraph stations they see fit on account of the eight-hour law for telegraph operators. Statistics also are presented to show that the revenue derived from telegraph business of a general nature from the communities affected is almost nothing.

On the North-Western road the total number of stations affected is forty-one, the average number of messages per month at each office is six, the average monthly receipts per office is ninety cents, the average receipts for all the offices put together is $36.90.

If, in order to care for telegrams for the public at these stations the railroads were required to

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maintain operators, it would be about possible to hire one apprentice operator for the aggregate revenue from all the business handled.

The President on the Railroad Situation.

In view of possible serious industrial disputes in the railroad field, President Roosevelt addressed the following letter under date of February 18 to the Interstate Commerce Commission:

To the Interstate Commerce Commission:

I am informed that a number of railroad companies have served notice of a proposed reduction of wages on their employes. One of them, the Louisville and Nashville, in announcing the reduction, states that "the drastic laws inimical to the interests of the railroads that have in the past year or two been enacted by Congress and the state legislatures" are largely or chiefly responsible for the conditions requiring the reduction.

Under such circumstances it is possible that the public may soon be confronted by serious industrial disputes, and the law provides that in such case either party may demand the services of your chairman and of the Commissioner of Labor as a board of mediation and conciliation. These reductions in wages may be warranted, or they may not. As to this, the public, which is a vitally interested party, can form no judgment without a more complete knowledge of the essential facts and real merits of the case than it now has or than it can possibly obtain from the special pleadings certain to be put forth by each side in case their dispute should bring about serious interruption to traffic. If the reduction in wages is due to natural causes, the loss of business being such that the burden should be, and is, equitably distributed between capitalist and wage worker, the public should know it. If it is caused by legislation the public and Congress should know it, and if it is caused by misconduct in the past financial or other operations of any railroad, then everybody should know it, especially if the excuse of unfriendly legislation is advanced as a method of covering up past business misconduct by the railroad managers, or as a justification for failure to treat fairly the wage-earning employes of the company.

Moreover, an industrial conflict between a railroad corporation and its employes offers peculiar opportunities to any small number of evil-disposed persons to destroy life and property and foment public disorder. Of course, if life, property and public order are endangered prompt and drastic measures for their protection become the first plain duty. All other issues then become subordinate to the preservation of the public peace, and the real merits of the original controversy are necessarily lost from view. This vital consideration should be ever kept in mind by all law-abiding and far-sighted members of labor organizations.

It is sincerely to be hoped, therefore, that any wage controversy that may arise between the railroads and their employes may find a peaceful solution through the methods of conciliation and arbitration already provided by Congress, which have proved so effective during the past year. To this end the commission should be in a position to have available for any board of conciliation or arbitration relevant data pertaining to such carriers as may become involved in industrial disputes. Should conciliation fail to effect a settlement and arbitration be rejected, accurate information should be available in order to develop a properly informed public opinion.

I therefore ask you to make such investigation, both of your records and by any other means at your command, as will enable you to furnish data concerning such conditions obtaining on the Louisville and Nashville and any other roads as may relate directly or indirectly to the real merits of the possibly impending controversy. THEODORE ROOSEVELT.

New Employers' Liability Bill in Congress.

A comprehensive employers' liability bill was introduced in the Senate and House on February 13 by Senator La Follette, of Wisconsin, and Representative Sterling, of Illinois. The authors say the bill has the endorsement of the Brotherhood of Locomotive Engineers, Brotherhood of Locomotive Firemen and Enginemen, and Brotherhood of Railroad Trainmen, and other railroad organizations, and that it is intended to meet the recent decision of the Supreme Court, in which the employers' liability act of June 1, 1906, was declared unconstitutional.

Kentucky is now wheeling into line with other states and is seeking to "regulate" the telegraph, telephone and express companies doing business in that commonwealth, to promote which a bill has been introduced into its legislature. It would lodge jurisdiction in these particulars in general with the railroad commission, while in particular a clerk, to be appointed at a salary of $1,200 a year will determine whether or no these "common carriers" are practicing extortion upon the people of the Blue Grass state.

Assemblyman Johnston, the Independence League member of the lower house of the New York Legislature, has introduced two bills affecting telegraph companies. One prohibits a telegraph company from sending by mail a telegram for which it has accepted toll. The second bill compels the telegraph companies to stamp conspicuously on every telegram the hour of filing as well as the time received. Failure to comply with this provision is punishable by a fine of from $200 to $1,000.

An Austin, Texas, court has awarded a verdict of $3,500 against the Western Union Telegraph Company in favor of a man who was knocked down and injured by one of its messenger boys mounted on a bicycle while hurrying to deliver a telegram. This verdict is a result of the second trial of the case. The jury in the first trial awarded the plaintiff damages to the extent of $3,900.

The city of Anniston, Ala., is endeavoring to compel the Western Union and Postal telegraph companies to pay a license fee of $250 each for the privilege of doing business in that place. The companies state that the amount demanded is excessive, but the mayor is quoted as asserting that he believes the companies will pay before allowing the matter to be taken into the court.

Massachusetts is also getting in line to compel the telegraph companies to place the filing as well as the receiving time on all telegrams.

The Postal Telegraph-Cable Company has protested to the city council of Beatrice, Neb., against the levying of an occupation tax of $25 per year

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on telegraph companies. The management states that the intrastate business done by the local office for the twelve months ending October 31, 1907, was but $93.55. Comment is hardly necessary in such a case as this.

Press Service in Nebraska.

A lawyer of Nebraska has written to the state railway commission of that state urging that special newspaper rates by telegraph companies were unjust. He cited the fact that the commission had recently ordered the Bell Telephone Company not to furnish telephones to the employees of the Burlington railroad at a less rate than to other individuals, and suggested that if this action was right and proper it was also fair that the telegraph companies be stopped from giving special rates to newspapers.

Newspapers receive special rates from telegraph companies in consideration of the great amount of business transacted by them. The telegraph companies figure that on a slightly increased expense for operation and at no extra expense of equipment they are able to induce newspapers to do much more business in the aggregate at a low rate than would be done were newspapers restricted to the usual rate.

The state railway commission has written a letter to the complaining attorney, calling his attention to the statutes which provides for this reduced rate to all newspapers and inasmuch as that statute has not been changed by the legislature, and for the further reason that reduced telegraph rates to newspapers is in the interest of the public, the commission has no authority to do anything in the matter.

Municipal Ownership vs. Public Regulation and Control.*

The subjects of municipal ownership and of public regulation and control of public utilities are intimately connected with each other. Neither can be adequately discussed without reference to the other. Indeed, one is the alternative of the other. Municipal ownership is demanded largely because of the absence of proper public regulation and control. Public regulation and control, if efficient, removes the necessity or excuse for municipal ownership by securing fair treatment for the public.

If, therefore, a system of public regulation and control, which is at once fair to the corporate interests involved and efficient in securing the results to which the public is equitably entitled, can be evolved and put into operation, municipal ownership can no longer be alleged to be essential to the public interest. What the public wants is efficient and adequate service at fair prices. This is all that could be hoped for from municipal ownership, which, if successful in those particulars, would involve financial risks and political consequences which it is of the highest importance to avoid. Leaving out of consideration those political theorists who adhere to the doctrine that the government should govern as much instead of as little as possible, and that a public official should be substituted for a private citizen whenever and wherever possible, the great body of our people prefer the original American idea, that the functions of government should whenever practicable be restricted rather than enlarged, and that undertakings of an essentially business character are best entrusted to private enterprise rather than to political manipulation. The public funds should be employed solely for public purposes and the tax levy should not be subjected to the perils of commercial enterprises.

But, adhering to these sound tenets, a large body of the public feels itself driven to the more or less favorable consideration of municipal ownership, by the feeling that in no other way less objectionable on general principles can those results to which the public is entitled be obtained. Where private enterprise results only in private gain and not at all or only insufficiently in public advantage, the demand for municipal ownership is natural and inevitable. This fact alone suggests the antidote. If private enterprise results to the public advantage as well as in private gain, the basis for the demand for public ownership is gone.

Assuming, however, as a knowledge of human nature compels us to assume, that a recognition of these fundamental principles cannot be expected on the part of all owners of private industries, we are forced to the consideration of measures to compensate for that fact. That which is now uppermost in the public mind is public supervision and control. In the judgment of your committee some form of such supervision and control is inevitable in many if not all of the important states of the Union, and we believe that it should be welcomed by the parties in interest, provided it is put, as we believe it can be, in such form as to preserve the rights and properties of the companies as well as to promote the interests of the public.

* * * * * *

While an agreement may be reached upon the general principle that public regulation and control of public-service corporations is desirable in the public interest, and is not necessarily inimical to the safety and value of corporate investments, it is another and much more difficult matter to agree upon the nature and scope of it. Three systems may be suggested: First, one like the Massachusetts and New York systems, under which everything is practically left to the judicial or quasi-judicial discretion of state officials, clothed with amplest power; second, a system that, so far as possible, will be automatic or semi-automatic in its operation, through the application of statutory requirements to existing conditions by administrative officials; third, a system

* Excerpts from the Report of the Committee of Public Policy of the National Electric Light Association.

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that will be a compromise between, or involve an application in part of the features of, both of the foregoing.

* * * * * *

Whatever claims of superior efficiency may be advanced in favor of a system of supervision and control of the New York type are offset by the objection of placing the vast interests of stockholders in the keeping, and, as history shows, frequently at the mercy, of public functionaries, who sometimes are, but more frequently are not, fitted by education or experience for the discharge of the delicate duties of their positions. Nothing stands between the companies and the exercise of the unrestrained action of such officials but the guarantees of the federal constitution. But such guaranties only protect against absolute spoliation and furnish no redress for lesser but almost equally serious injuries which may be inflicted through official action.

One great difficulty under systems of undefined public control is the inability or unwillingness of officials to distanguish between the regulation and the operation of corporations. Regulation should stop where operation begins. Matters of business discretion should be left to the decision of those who are responsible for business results. The directors of the affairs of a corporation undoubtedly, in most instances, are better judges of questions of business expediency than outside officials, however enlightened.

But it is always the tendency of public bodies clothed with judicial powers or official discretion to enlarge their own jurisdiction, and it is not therefore to be expected that they will set proper limits to their authority.

The remedy for this difficulty is to have the obligations of the corporations and the authority of the officials so defined by statute as to make the operation of the provisions of the law upon the state of facts in hand as nearly as possible automatic, calling for the interference of public officials only to the extent of applying the law to the facts as found. The ascertaining of the facts need not, and usually would not, involve to any considerable extent the exercise of discretionary or judicial functions. In short, under such a system the supervisory officials are in the position of a jury, accepting the law directly from the legislature and merely applying it to the facts as found by them.

If the objection is made that such a suggestion needs demonstration of its practicability before it is accepted, the answer is that if the theory is sound it can undoubtedly be worked out in practice, though many details may have to be developed and perfected through experience. But that such a system is practically as well as theoretically sound, is demonstrable through the application of the so-called "sliding scale." This, when once adjusted to the case in hand, will automatically settle the great questions of rates and dividends, to the satisfaction of both the private and public interests involved. The settlement of these two important items—one the most important from the public's point of view, and the other the most important from the corporate point of view—will go far toward removing other difficulties.

* * * * * *

Entertaining as we do the thorough conviction that the interests of the public-service corporations of the country and of the communities which they serve are in truth and in fact identical, we believe these interests will ultimately be shown and acknowledged to be identical. The energies of this committee and of this association should be bent toward bringing about such relations between the public and private interests involved as will demonstrate the soundness of the conclusion as stated.—Concerning Municipal Ownership.

The Education of the Electrical Engineer.

Charles P. Steinmetz, consulting engineer of the General Electric Company, Schenectady, N. Y., recently gave his views in an address before the American Institute of Electrical Engineers, New York, on the education of the electrical engineer, a part of which appeared in our columns in the issue of February 16. In a subsequent discussion of the subject, Dr. Steinmetz said:

"Drop out a sufficiently large part of the quantity which the college now attempts to teach so as to get the time to improve the quality of the rest by thoroughly teaching it; that is, going over the subject over and over again, preaching it from different viewpoints, because after all a clear and thorough understanding of a subject is gained only by looking at it from every possible point of view. For instance, an induction motor is not understood properly by considering it as a short-circuited armature revolving in a rotated field; it is not understood by considering it as an armature acted upon through the medium of magnetic fields, or by the derivitation of the direct-current shunt motor combined with the transformer action, transferring power to the motor instead of leading it in by commutator or brushes, nor is it understood by considering it as an electric circuit revolving in a magnetic field; you have to approach it looking at it from all these viewpoints before you can thoroughly understand it. There is no time for this in the present college course when you attempt to teach all you do now.

"I do not believe in text books. I agree that a good text book is better than a poor instructor. You may carry that still further and say that a good corresponding school is better than a poor college. A good text book appears to me merely a way of ameliorating a little the objectionable effects of a poor instructor, but a good instructor or professor is vastly superior to the best text book."

There is much for telegraph operators to learn respecting their calling which can be readily obtained by reading Telegraph Age—$1.50 a year.

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Settlement of a Canadian Wage Dispute.

In adjusting the dispute between the Grand Trunk Railway and its telegraph operators recently, the board of investigation acting under the Lemieux Act, composed of Prof. A. Shortt, J. G. O'Donoghue and W. Nesbett, K. C., reported in part as follows:

"The board were much impressed by the suggestions that the same board had recommended a higher rate of pay to the telegraphers in the service of the Canadian Pacific than they were prepared to recommend in the present instance. We are glad to be able to report that the parties appreciated the reasons why the members of the board could not in this instance see their way to the recommendation of any higher rate than that finally agreed upon between the parties, and we desire to put upon record some of the reasons why we came to this conclusion.

"We thought, under the present conditions, that the offer of the company in the matter of increase of wages was all that could be justified. There are many considerations entering into the question. In our view, there is the right of the men to receive a living wage, and that right is paramount. The workman is entitled to get a fair day's wage for a fair day's work. What, however, often seems to be ignored is that capital and labor are both necessary in order to produce a profit, whether it is in the operation of railways, in manufacturing, or in any other branch of trade. The aim of the work should be to secure a fair share of this profit. But there is also to be considered the position of the man who advances the money to enable the undertaking to be carried on which gives employment. He, too, is entitled to receive a return for his money and his risk. A hundred millions of the capital stock of the Grand Trunk Railway receives no dividend whatever. If such dividends on the preferred stock as are now being paid are still further reduced by the wages bill being increased, what must necessarily follow? The company cannot obtain further money for expansion, for it can be more remuneratively employed in other undertakings. This certainly would be a disadvantage to the vast numbers who find employment on railways. Then there is the constant demand of the public for the betterment of the service and equipment, for increase of facilities, the bettering of the roadbed and general improvement in the accommodations. These can only be obtained where the parties asked to advance the money can see some possibility of return for the advance. Our experience on a number of these boards has led us to the conclusion that there seems to be an oversight on the part of the public of two things: First, that there is a continual demand for an increase of expenditure upon the part of the company for facilities, and, second, a continual demand for a reduction of the tariffs which furnish the moneys necessary to provide these facilities and accommodations. The growth of earnings is not keeping pace proportionately with the growth of expenses. If the operating expenses and the wages to employees must be increased from time to time, and the public so demand, very serious considerations must be given to the proposals for the reduction of freight and passenger rates, inasmuch as every reduction directly affects the ability of the railways to pay the wages asked by their employees. There is no doubt that the cost of living has greatly increased, and that the employees of a railway company are entitled to be better compensated to meet such increased cost, but surely they are not entitled to be compensated at the sole expense of people who have invested their money and who would in return be deprived of their means of livelihood. The public should bear their share. The railway employee spends his money for the benefit of every other member of the community from farmer to manufacturer, and if the employee has to obtain more money to meet his increased cost of living, other classes of the community who receive the benefit of the money he spends should contribute their share toward enabling him to get the money he has to spend; and it is for the foregoing reasons that, under the present conditions, and having in view all the surrounding circumstances, we thought that the offer of increase made by the officials of the Grand Trunk Railway Company had gone as far as could be justified, though not necessarily to the limit which the telegraphers ought to receive under other circumstances. The deterring of the investment of capital in railway undertakings would certainly not be a benefit to the community at large, and if the property of lenders is to be practically confiscated between the demand of the public on the one side and the demand of the employees on the other, it must lead to a general reduction in wages or a shrinkage in the number of employees, with a much greater ultimate loss to labor. It has been suggested that this state of affairs may be met by the state becoming sole owner of the railways. To accomplish this the capital necessary to make railways and work them would still have to be found. The mere fact of state ownership does not bring capital down from the skies like the manna to the Israelites in the desert. If borrowed by the state, interest must be paid for it, and probably at a higher rate than the state now has to pay, for two reasons, first, because of being larger borrowers; second, because of the risk incident to industrial undertakings. If raised by taxation, this would be nothing more than getting it from the collective resources of the country. The wages, other than the living wage before referred to, which are paid by railway companies to their employees must, therefore, disguise it as we may, depend upon what a company earns after the interest on capital employed is paid. This may equally be said of all industrial and commercial undertakings, and no amount of vague philanthropic talk can alter this fact any more than it can alter the fact that two and two make four."

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Original Call for the Permanent Organization of the Military Telegraph Corps.

It will be of interest not alone to the membership, but also to the telegraph fraternity in general, to read the circular call issued nearly twenty-six years ago announcing the meeting having in view the formation of a permanent society of the United States Military Telegraph Corps. The charter membership and the subsequent muster roll of these war telegraph veterans has since been thinned, but those still remaining hold fast to the society and to each other with an increasing loyalty and affection as time passes.

Chicago, August 19, 1882.

Dear Comrade:

A meeting of the members of the United States Military Telegraph Corps was held at Club Room 1, Grand Pacific Hotel, Chicago, on the evening of August 18, 1882, looking toward the organization of a permanent society.

Charter Members.—Gen. Anson Stager, Col. J. C. Van Duzer, Col. R. C. Clowry, Col. W. L. Gross, Col. S. G. Lynch, S. L. Robinson, John Thomas, F. C. Long, H. P. Darlington, F. B. Knight, J. N. Crittenton, W. A. Leary, C. G. Eddy, M. C. Bristol, W. T. Lindley, G. M. Farnham, Maynard Huych, W. R. Plum, L. D. Parker, C. G. Sholes, J. E. Pettit, E. P. Whitford, A. W. Nohe, James W. Atwell, Chas. B. Burch, H. W. Plum, C. W. Jacques, C. H. Lithgow, A. H. Bliss, W. S. Chapman, Charles L. Clarke.

Herewith you will find a copy of the constitution and by-laws adopted at said meeting, and you are earnestly requested to read the same and signify to the secretary, by mail, immediately, if it be your wish to become a member.

Your attention is urgently called to articles 6 and 7 of the constitution, in the hope that you may be able to assist in the formation of a local organization, as it is thought that more can be accomplished in that way if you are located in the vicinity of enough others to form such branch society.

It is the intention of the society to hold a grand reunion at Niagara Falls on the 21st day of September, 1882, for the purpose of perfecting a national organization, and, also, meeting the members of the Society of Old Timers.

The officers elected to serve until the first reunion are as follows: W. R. Plum (firm of Page & Plum), president; L. D. Parker, assistant general superintendent Mutual Union Telegraph Company, vice-president; J. E. Pettit, manager, Mutual Union Telegraph Company, secretary and treasurer.

Executive committee.—W. R. Plum, ex-officio, chairman; General Anson Stager, president telephone company; Col. R. C. Clowry, general superintendent Western Union Telegraph Company; C. G. Sholes, superintendent Chicago and Milwaukee Telegraph Company; Col. J. J. S. Wilson, ex-superintendent Western Union Telegraph Company; Col. S. G. Lynch, manager Western Electric Manufacturing Company; E. P. Whitford, manager Western Union Board Trade office; H. P. Darlington, broker; S. L. Robinson broker.

You are cordially invited to attend the re-union, and by your presence promote the welfare of the society.

Fraternally yours,
J. E. Pettit, Secretary,
care Mutual Union Telegraph Co.,
Chicago, Ill.

The Telegraph Alphabet.

Very general approval has been expressed by the telegraph fraternity at the publication appearing recently in Telegraph Age of telegraphic characters showing the Morse and Continental alphabets, the short numerals generally used by Continental operators, together with the punctuation marks of the Morse, Continental and Phillips systems, besides other information of value in transmission, so arranged that all differences may be observed at a glance. The evident need of such a compilation in view of the numerous errors made in defining telegraphic characters, that have been allowed to find their way into some of the current books treating on telegraphy, has been made all the more manifest by the numerous requests received for the issue of the paper containing this presentation. The strict accuracy of the transcription has recommended it. As an authority it is, of course, unquestioned, and has already been the means of setting many an operator right and settling numerous disputed points. We desire to say that copies of the paper containing this valuable data, so convenient for reference, and of date February 1, may still be had at ten cents apiece, and will be mailed to any point on receipt of price. Address all orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Secretary's Report of the Old Time Telegraphers' and Historical Association.

John Brant, secretary of the Old Time Telegraphers' and Historical Association makes this report: That at the beginning of the fiscal year 1907 there were 1,442 members on the roll. During that year forty-one applied for membership, and a corresponding number of certificates were issued. So far as known seventeen have been reported as having died during the year, five resigned and sixty-six were dropped from the roll for non-payment of dues, leaving a net membership of 1,395.

The names of the dead are: Rufus B. Bullock, Herbert Y. Bresee, William A. Hennessy, W. J. Johnston, Mrs. M. E. Randolph, Archibald Wilson, Jr., Peter T. Brady, William D. Black, Charles A. Hicks, William Koons, Edwin Rogers, William S. Humes, John Beatty, Jr., Joseph W. Fisher, William H. Harper, John S. Noble and William F. Shiebler.

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What is Electricity?

The editor of London Electricity says:

Electrical engineers are very often twitted by non-technical people with the fact that they cannot define what electricity is. It seems to the outsider an extraordinary thing that electricians who work with a something which they can calculate and measure with absolute precision are unable to define its nature. A little thought, however, is sufficient to show that electricity is not the only thing which is incapable of definition. If, for instance, we attempt to define what iron is, or in fact what anything is which is in common use, we see at once that our definitions are merely definitions of what these various objects can do, or the uses to which they can be put. Thus, if we define lead as a soft white metal, which can be bent cold into various shapes, which can be cast in moulds, and whose melting point is a certain value, we do not say what lead is, we simply define its properties, and beyond that we cannot go. As a matter of fact, we can define electricity in terms of its properties and capabilities with much greater precision than we can define most other things, but what it really is, up to the present remains a mystery.

In the February number of the Grand Magazine, Dr. Gustave Le Bon essays to define specifically what electricity is, and for this purpose discusses at some length the electronic theory of matter. It is very difficult to describe any scientific phenomena in popular language which the average reader can understand. The simplest inscription in Hebrew would be unintelligible to any man who was not familiar with the Hebrew language. Similarly, no matter how simply a scientific process may be described, the description is very largely unintelligible to one who is not conversant with scientific terminology. Dr. Le Bon, however, has succeeded in putting his views into the clearest and simplest possible language, and has given an intelligible account of what is now understood by electricity.

Lest I should detract from the simplicity of the author's explanation, I give the following quotation *literatim* from his article:

From the most remote ages it has been known that if a stick of resin be rubbed, electricity is the consequence. The rubbing of a body is thus a source of electricity. Whence comes this electricity? How does rubbing produce electricity? Until quite recently it was impossible to give an answer to either of these questions. The theory of the dissociation of matter now furnishes us with an explanation.

The plain explanation is that when we rub a body, what actually happens is that its atoms are partially dissociated, and some of the energy they contain is liberated in the form of electricity.

How, now, may we prove that electricity results from the dissociation of matter?

The demonstration of this is quite simple. We find that the effluvia emitted by the poles of an electric machine in rotation possess identically the same properties as the particles emanating from bodies spontaneously radio-active, such as radium, uranium, and thorium.

Among the most important of these properties are the faculty of condensing aqueous vapor, of being deflected by a magnetic field, and of traversing material obstacles. When the poles of an electric machine are separated, the particles of dissociated matter are emitted in the form of effluvia. Let the poles, on the other hand, be brought nearer together; at once the contrary electric particles attract each other and condense into a small number of lines. They then form those crackling sparks, the discovery of which places in the hands of mortals the power to engender the lightning which, formerly, was held to be one of the most jealously guarded attributes of the gods.

These particles, when the electrical tension is raised to several thousand volts, are able, as I have often demonstrated, to pass visibly through matter. When, therefore, we see sparks produced by an electrical machine, we really are witnessing the dissociation of matter. Electricity, whatever form it may take, has no other origin but this. The gigantic commercial dynamos, equally with the small experimental machines used in laboratories, serve to dissociate matter, and to do this alone. The electric current which provides us with light and transmits our thoughts through continents and oceans is provided by the dissociation of matter.

Even after having read this statement, I am a little in doubt as to whether Dr. Le Bon has really succeeded in defining electricity, or whether he has merely defined again its method of production. He tells us that the dissociation of atoms results in the liberation of a form of electricity; but after all, this does not tell us what electricity is. Nor am I convinced yet whether the friction between two bodies rubbed together is caused by the latent electricity in the bodies, or whether the electricity is the result of the friction. It seems to me, therefore, that all these attempts to define electricity or other similar forces are more or less attempts to define the undefinable and to know the unknowable.

The Canadian Yukon Telegraph.

The Dominion minister of public works stated recently in the House of Commons that the government telegraph system of the Yukon had earned $52,725 from March 31 to December 11, 1907, but during the same period the expenses were $136,188, and there has been no expenditure on capital account. According to reports received, says the Western Electrician, the line is in a bad condition, and a number of complaints have been received from business men at Fort Essington, Prince Rupert and Port Simpson. The main line of this system extends from Ashcroft, a station on the Canadian Pacific Railroad, about 200 miles east of Vancouver, to Dawson City. The towns of Fort Essington, Prince Rupert and Port Simpson are served by a branch which leaves the main line at Hazelton, and it is of this branch that complaint is made. It is stated that the line between Hazelton and Prince Rupert was down from October 21 to November 30, 1907, except for a few periods of one or two hours each.

TELEGRAPH AGE is the only telegraphic newspaper published in America. It is up to date, covering its field thoroughly, and no telegraph official or operator can afford to be without it.

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"Don'ts" for Users of Electrical Instruments.

(From Electricity, of London.)

Don't stand a moving coil instrument on top of an excited dynamo—unless you have no further use for it.

Don't connect up an ammeter without its shunt, or a voltmeter without its external resistance. It will only "cost you more."

Don't forget to connect an ammeter onto its shunt. A moving-coil instrument does not want much current, but it can do with just a little.

Don't connect an ammeter across the mains as you would a voltmeter. You won't hurt the generator much, but the instrument

Don't connect a voltmeter onto an ammeter shunt. Nothing will happen if you do; that's just the trouble.

Don't file up a shunt because it won't fit. You'll increase the drop; and a "drop" too much isn't good for anybody.

Don't bolt a shunt onto the back stem of a fuse and blame it for getting hot.

Don't reduce or add to the length of leads furnished with a shunted ammeter or wattmeter for connecting to a shunt. If you do, you will make your meter record high or low.

Don't abuse the maker because your ammeter is off zero. He has given you a simple means to rectify this. You might just as well send for a clockmaker because your watch was five minutes fast.

Don't forget that a watch won't go until wound up, nor will a voltmeter until connected in circuit.

Don't expect a voltmeter to work with a blown or absent fuse in series. The resistance of a fuse which is not there is sufficiently great to interfere with the satisfactory working of the instrument.

Don't be surprised if a permanent-magnet instrument won't measure alternating current; it begins to hesitate and cannot make up its mind which way to go.

Don't expect an instrument to read if it has a pointer catch holding the pointer to zero. Some instruments are so provided, and it is considered good practice to release it.

Don't send away a switchboard with the instruments bolted on to it. If you have ever traveled by freight train, sitting on a marble seat, you will understand why.

Don't open up an instrument just to "see how it works." It probably won't do so any longer. Instruments are apt to resent the intrusion, hence the seals.

Don't suppose that an instrument is sealed because the manufacturer is ashamed of the inside. It is because he is proud of it. The seals are really provided for the protection of the user, if he only knew it.

Don't think that working instructions are sent out merely to worry you. You may know all about it without reading them, or you may think you do—which is not always quite the same thing.

Don't drop a meter and then tell the maker you didn't. He may not know as much as you, but he does know a little, and he keeps a tame Sherlock Holmes who is a perfect marvel.

Don't, when sending particulars of your requirements to the manufacturer, give as few, but as many, as possible. He is pretty good at conundrums, but might guess wrong.

Don't be afraid to consult the instrument maker when you are in a hole. He does not know everything, but he earns his bread and butter by knowing all about instruments.

Don't forget that you deal in amperes and volts just as a grocer deals in tea and sugar. He cannot afford to be without a good pair of scales, neither can you without accurate testing instruments.

Don't trouble about these "don'ts" if you think you know all about measuring instruments; but if you do, don't, because you don't.

Mr. Ledwith Appreciates the Silver Anniversary Number.

R. W. Ledwith, of Chicago, telegrapher and newspaper writer, has this to say appreciative of the silver anniversary number of January 1 of Telegraph Age:

"I desire to congratulate you upon the artistic arrangement, typographical appearance, composition and clean editing of your silver issue. I consider it a valuable contribution to the archives of the Morse system, immensely so in accurately portraying the individuality of those intimately identified with its development.

"I thank you for sending me a copy of this issue. I will keep it as a memento of other days—days when the acme of individual ambition was measured by a laudable desire to excel. But ambition, like time, changes. I look upon it now as an iridescence."

Mr. Ledwith, who possesses a wide acquaintance in telegraph circles and with a memory which cherishes pleasant recollections of other days and of the engaging personality of many then connected with the service, concludes his letter as follows:

"By-the-by, what has become of our mutual friend, Walter P. Phillips, for whom, in a newspaper way, and I may properly say as much telegraphically, I have great respect?

"When I recall W. J. Johnston, 'Joe' Christie, 'Billy' Wallace, the first of the old 'Operator,' the second of 'The Magnet' and the third of 'The Switch,' with others, I recall the value, journalistic ability displayed and usefulness of the craft in the broad field of literary endeavor. In a plain, unvarnished way the story of telegraphic journalism is worthy of a place in the fascinating and marvelous development and utility of Morse telegraphy. As much so, in my opinion, as the value and patriotism of the 'military corps,' or any other corps within its ranks. Some disinterested Prescott will pen it some day!"

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A New Biography of Edison.

Francis Arthur Jones, an English newspaper man, has published an autobiography of Thomas A. Edison, which appears to be out of the ordinary. The author admits frankly in the preface that the sketch is in no sense an exhaustive one; indeed, it could not be within the limits observed. What Mr. Jones has done is to review rapidly a notable career, presenting information about Mr. Edison's achievements and Mr. Edison himself in an easy, journalistic style. One could wish at times that more attention had been paid to the form of the narrative. The introductory chapter, in particular, being susceptible of much improvement. However, the story as it stands is sufficiently readable, and, because of its subject, it could not fail to be of interest to members of the telegraph profession, of which Mr. Edison himself is so distinguished a graduate.

Facts concerning Mr. Thomas Alva Edison's life are easily obtainable from current works of reference and need hardly be rehearsed here. The biography prepared by Mr. Jones, with the assistance of Mr. Edison himself, of Mrs. Edison and of many friends of the inventor, contains a mass of anecdotes obtained at first hand that possess much interest for the general reader who is interested in Mr. Edison's peculiar personality. It is largely to these anecdotes that the present notice will be confined.

It was on a cold day in February, 1847, that a boy was born to a young couple in Milan, Ohio. The father, Samuel Edison, was of Dutch and the mother of Scotch extraction.

"It's a pretty child," said the nurse, "fair, with gray eyes—the very image of his mother." Mr. Edison received the news philosophically, and a little later, when allowed to see the child, he regarded it with great interest. The boy certainly was like his mother, that was a fact, and the father expressed his pleasure at the resemblance and remarked that if he grew like her in disposition as well as feature then he would indeed prove a blessing to them. His mother adored him from the moment he was placed in her arms and there was from the first an affection between them which increased as the child grew.

"I was always a careless boy," says the inventor, "and with a mother of different mental calibre I should have probably turned out badly. But her firmness, her sweetness, her goodness were potent powers to keep me in the right path. I remember I used never to be able to get along at school. I don't know now what it was, but I was always at the foot of the class. I used to feel that the teachers never sympathized with me and that my father thought that I was stupid, and at last I almost decided that I must really be a dunce. My mother was always kind, always sympathetic, and she never misunderstood or misjudged me. But I was afraid to tell her all my difficulties at school, for fear she too might lose her confidence in me.

"One day I overheard the teacher tell the inspector that I was 'addled' and it would not be worth while keeping me in school any longer. I was so hurt by this last straw that I burst out crying and went home and told my mother about it. Then I found out what a good thing a good mother was. She came out as my strong defender. Mother love was aroused, mother pride wounded to the quick. She took me back to the school and angrily told the teacher that he didn't know what he was talking about, that I had more brains than he himself, and a lot more talk like that. In fact, she was the most enthusiastic champion a boy ever had, and I determined right then that I would be worthy of her and show her that her confidence was not misplaced. My mother was the making of me. She was so true, so sure of me; and I felt that I had some one to live for, some one I must not disappoint. The memory of her will always be a blessing to me."

When "Al," as his mother always called him, emerged from baby clothes and was able to walk and talk, neighbors soon made the discovery that he was rather a remarkable looking child. He had a fine large, well shaped head, of which his mother was very proud. But his hair was a terrible trial to her. It would not curl, it would not part, it would not lie down like other boys'. He was always rumpling it with his baby fingers, and so the only thing to be done was to keep it "close," a plan which was advocated by his father, and adopted, after a mental struggle, by his mother. He had a broad, smooth forehead, deep set eyes, almost straight brows, and the sweetest, most amiable and lovable mouth ever seen in a baby. His high forehead was usually unruffled and serene, except when he asked those innumerable questions which came to his lips almost as soon as he could talk.

At four years of age he was friendly with all the neighboring children, especially boys, and every one liked him. He was fond of making his way to the shipbuilding yards. He would pick up and examine every tool he could find, ask a hundred questions of the busy workmen, get under their feet and in their path, and bother them generally. None the less they liked him, though often they thought his questions foolish, and set him down consequently as anything but bright. Even his father, forty years later, said that many folk thought he was lacking in ordinary intelligence. He was forever asking his father the reason for this and that, and when, in very desperation and thinking frankness the better policy, the unhappy parent would answer, "I don't know," the boy would reduce him to still deeper depths of distraction by instantly demanding, "Why don't you know?"

There are many people in Milan to-day who remember little "Al" Edison, and they will tell you how on one occasion he chased the old goose off her nest and tried to hatch out the eggs him-

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self by sitting on them, just to satisfy a natural desire to know how it was done. A little later on he evinced his first interest in avian flight by endeavoring to persuade the hired girl to swallow some fearful concoction, with the promise that if she did so she would certainly be able to fly. The young woman firmly declined to try the experiment, but "Al," who in all probability thoroughly believed what he had undoubtedly been told, was so persistent in his entreaties that she would try even a little that at last she swallowed a small dose and immediately became so ill that the doctor had to be summoned. The boy expressed regret that she was sick, but appeared to think that her inability to fly lay with herself and not with the liquid.

Young Edison at the age of twelve became a newsboy on the Grand Trunk line, running between Port Huron and Detroit. Gaining the exclusive right of selling newspapers on this line and purchasing some old type, with the aid of four assistants he printed and issued the Grand Trunk Herald, the first newspaper printed on a railway train.

"It was a little bit of a thing, about the size of a lady's handkerchief," says one of these assistants. "Of course he did not set it up altogether on the train, because you cannot set type and have it stand up in a car, but it was printed there. Sometimes the stationmaster at Mount Clemens, who was also a telegraph operator, would catch some country news on the wires, and he would write it down and hand it to "Al" when the train came in. This news, of course, would be later than that contained in the daily papers. He would immediately retire to his caboose, set it up, put it in the little form, and before the train reached Ridgeway he would have it printed off. I sold lots of these papers for three cents each."

A stationmaster, in gratitude for his having saved his child from the front of an advancing train, taught Edison telegraphy, in which he had previously been greatly interested, and procured for him a job as night operator at Port Huron station.

Many stories are still told at Port Huron of the wonderful skill and quickness he soon developed in grappling with a difficulty. On one occasion, for instance, there was an interruption in the line to Detroit, and the day operator asked Edison to look out and try to ascertain where the trouble was. The boy immediately laid a wire from his father's house and strung it along the railway fence. Thence he tumbled down the bank by the swing bridge and fastened a wire to one end of the cable, which, as he suspected, had been parted by a passing vessel. Then he went back and was telling the day operator what he had done when George Christie, a line repairer, came along, and, overhearing the conversation, dropped his kit and wanted to lick Edison for interfering with his work. But the day operators got between them and prevented a fight and Edison escaped. Christie was finally persuaded that the boy he was desirous of clubbing had really performed a far-sighted and commendable feat.

The young man was about twenty when he patented his first invention. This was a vote recording machine, which worked perfectly as a simple yet adequate system for "purifying" the ballot.

He had been used to handling press reports, and the time taken in counting votes as well as the ease with which they could be "manipulated" had suggested to him the idea for the invention. So he traveled to Washington, and after some little delay succeeded in exhibiting his instrument to a committee chairman, who, after examining the machine very carefully, said: "Young man, it works all right and couldn't be better. With an instrument like that it would be difficult to monkey with the vote if you wanted to. But it won't do. In fact, it's the last thing on earth that we want here. Filibustering and delay in the counting of votes are often the only means we have for defeating bad legislation. So, though I admire your genius and the spirit which prompted you to invent so excellent a machine, we shan't require it here. Take the thing away."

Whereupon Edison mournfully shouldered his vote recorder and left the committee room. "Of course I was very sorry," said Edison afterward, "for I had banked on that machine bringing me in money. But it was a lesson to me. There and then I made a vow that I would never invent anything which was not wanted, or which was not necessary to the community at large. And so far I believe I have kept that vow."

Mr. Edison, indeed, is remarkably practical, so Mr. Jones informs us. When the phonograph was in its infancy he was complimented by a well known scientist upon the wonder he had achieved, but somewhat startled his admirer by replying: "Yes, but it doesn't bring in any money."

Another story, illustrative of this side of his nature, is also connected with his phonographic days. It was after he had made the cylinders of wax and when a fine delicate brush was necessary to keep them free from dust.

The brush he used cost a dollar, and he made up his mind that it must be possible to obtain one equally serviceable for half the money or less. The hair, of course, had to be exceedingly fine, so as not to scratch the record, and he had been told that what he required was costly and a dollar was the lowest price at which the brushes could be manufactured. Edison thought otherwise, and after he had obtained specimens of hair from almost every known animal he found that the red deer provided a hair so fine that it could scarcely be seen without the aid of a microscope. This was just what he had been looking for and thenceforth his phonograph brushes cost five cents instead of a dollar.

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On another occasion a visitor found Edison one Sunday morning deeply occupied with his phonographic dolls. One was in pieces beside him, and the inventor was busy scribbling figures and line diagrams in a pocketbook. When asked to explain what he was busy on, Mr. Edison said:

"The idea suddenly hit me at breakfast this morning that I might cheapen the cost of this doll, and I couldn't rest till to-morrow to put my plan to the test. It occurred to me that I could make the framework that holds this tiny phonograph cheaper by changing its shape and thus saving metal. The change in shape will permit me to substitute a small brass screw for this large one, and so I can save several cents that way, too."

From these little stories it must not be supposed that there is anything "close" about Edison. As a matter of fact, he cares little for wealth, and when experimenting or perfecting a new invention he never sits down to consider the cost. If it should take his entire fortune to attain his end he would spend it, and never since he has had the handling of big sums has he allowed expenditure to stand in the way of success."

If the inventions of Edison are remarkable, his biographer tells us, he himself is no less a physical wonder. For forty-five years he has labored incessantly regardless of the ordinary laws of nature. In the pursuit of some desired end time has been forgotten, sleep ignored, food left untouched, rest abandoned. Yet he has not suffered. To-day he looks twenty years younger than his age, and he can still work twenty or thirty hours at a stretch without feeling unduly fatigued. His juvenility is remarkable, and his capacity for recuperation is equally astonishing.

Perhaps the secret of his tireless activity is his determination never to worry. "Don't worry," says Edison, "but work hard, and you can look forward to a reasonably lengthy existence—barring accidents, of course."

Edison's passion for work has been likened to some men's love for strong drink, and the comparison is not at all bad. Recently the inventor stated one Saturday night that he intended to quit work for a spell and his manager need not expect him for a few days. That manager smiled, for he had heard the same thing before. Monday morning at eight Edison was hard at work as usual. It is probably the only thing that the inventor cannot do—give up work—and until he can invent something to make the task easy he probably never will.

Superintendent Jesse Hargrave, of the Postal Telegraph-Cable Company, as an Author.

Jesse Hargrave, until lately assistant electrical engineer of the Postal Telegraph-Cable Company, New York, and now one of its superintendents, recently essayed the role of author with distinct success. To the new and revised edition of "Electrical Instruments and Testing," by Norman H. Schneider, just out, which treats of the use of the voltmeter, ammeter, galvanometer, potentiometer, ohmmeter, the Wheatstone bridge and the standard portable testing sets, Mr. Hargrave has contributed important matter which appears in the two concluding chapters, one treating on testing telegraph wires and cables, the other in locating faults in telegraph and telephone wires and cables, in which valuable tables are given. This matter in detail may be summed up under the following heads: Early morning tests; wrecks; locating grounds by Wheatstone bridge measurements; measurement for crosses using Varley test; measurement for crosses using the two cross wires only; locating a cross by voltmeter test; insulation tests by milliammeter method; insulation tests by voltmeter method; conductivity tests; location of grounds and crosses by Varley method using multiplied arm ratios; how to find trouble after located; Varley test; Murray test; locating openings in cable conductors by bridge method; resistance measurement; fault location; to locate openings using buzzer and telephone. Mr. Hargrave's treatment of his subject has been especially well considered and embodies the best thought of this well-known telegraph authority who has devoted all the years of his business life to the telegraph service. Mr. Hargrave's experience in the class of tests he describes, respecting which telegraph people desire specific information, well qualifies him to prepare the descriptive matter he has so carefully done in this volume. There is, in fact, no other book that treats so comprehensively and with so much elaboration of detail the subjects he discusses. Mr. Hargrave's knowledge of the requirements necessary to fit a man for responsible service in telegraph employ has prompted him to furnish all necessary information to meet any probable emergency that is likely to arise in wire and cable testing.

The volume embraces 256 pages, has 133 illustrations and diagrams. Price, cloth, $1; in full limp leather, $2. Address all orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

New Catalogue.

We have received from the Leeds and Northrup Company, Philadelphia, a copy of their new catalogue, being the second edition of pamphlet No. 5, and which refers more especially to the portable testing sets and cable testing apparatus, manufactured by this concern. The pamphlet discusses with great detail the numerous products handled by this company, while the illustrations are both numerous and valuable as accessory in explantion to the subjects represented. Users of the various instruments described have learned to regard the literature of this house as being prepared with unusual care, experts in each case passing carefully upon all such matter.

The Leeds and Northrup Company will be glad to supply this catalogue to those interested, and invite correspondence.

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Reminiscences in the Busy Life of an Old-Time Telegrapher.

BY JAMES F. GORMLEY, OF BOSTON.

(Concluded from issue of February 16.)

The success that had thus far attended my efforts in establishing a chain of branch telegraph offices in the city of New York to be operated in conjunction with Colonel Speed's Independent line to New England, and its western connections, was beginning to attract attention in local telegraph circles. Indeed, considerable speculative comment and criticism of competing interests was already current.

At that time, as well as for many years thereafter, A. T. Stewart was the leading dry goods merchant of the metropolis. His marble store, palace as it was called, on the east side of Broadway, extending from Chambers to Reade streets, long devoted to retail purposes, had just been abandoned for the new and larger building at Broadway, Ninth and Tenth streets, now a part of the Wanamaker establishment, while the downtown structure, now converted into an office building, was devoted to the wholesale business of its owner. The business of the great firm of A. T. Stewart and Company, the largest of the kind in America, extended over every part of the country, and its telegraph requirements were enormous. To locate an office, therefore, at the Broadway and Chambers street corner was my ambition. It would be a money maker. But my aspiration in this instance was not to be realized. Mr. Libby, partner of Mr. Stewart, with whom I endeavored to negotiate for the privilege, and to whom, as an inducement, I offered to transmit free all the local messages of the firm between the downtown and uptown stores, became much interested in the proposition, towards which he appeared to be favorably inclined. I further requested that I might be allowed to install a telegraph instrument in the ticket office at Niblo's Garden (a famous theater), in the Metropolitan Hotel on Broadway, this property also being owned by Mr. Stewart. But Mr. Stewart was utterly opposed to granting a concession to anyone having in view the opening of a public telegraph office on his premises, no matter what terms might be offered or what firm conveniences might accrue by such an arrangement. He was peremptory in his refusal. The decision was characteristic of the man, a person who was not in sympathy with the public any further than as buyers of his goods. The idea, however, appealed strongly to Mr. Libby, and he desired me to submit an estimate for the building and equipment of a private line to connect a number of pieces of property owned by Mr. Stewart. But nothing ever came of this.

Business at the various offices I had opened was flourishing, but I began to have more or less trouble with several dishonest men in charge, who suddenly quit, forgetting to turn over the receipts to me before taking their departure. On top of this rather disquieting state of affairs and the setback I had received from Mr. Stewart, I received a request from General Marshall Lefferts of the American Telegraph Company, and a well-known merchant of New York, to call and see him. He eventually made me an offer to buy out my local telegraph line and assume direction of its offices. He proposed also that I identify myself with his telegraph interests. This I declined to do, but the proposition to purchase receiving the sanction of Frank Smith, son of F. O. J. Smith, with whom I was associated in the enterprise, the sale was effected, the line and offices being turned over to J. C. Hinchman, General Lefferts' representative.

Although my connection with this city-line business was not of very long duration, it proved to be a fairly profitable undertaking, and I was enabled to turn over to Frank Smith $550 as his share in the transaction. But my enterprise had served to direct attention afresh to the importance and need of establishing telegraph branch offices about the city as a means of promoting local business and to act as feeders to the main office. Apparently General Lefferts profited by what I had told him respecting my endeavor to gain permission to fit up a telegraph office in Mr. Stewart's store, for not long after, in coming out one day from the former's office I met Mr. Libby going in, who greeted me with a peculiar, quizzical smile that seemed to me to be suggestive at least.

In looking back over so many years one's mind becomes freighted with confused memories; so much so, in fact, as to make it difficult to recall the incidents and scenes of long ago, in sequential order when they crowd so upon recollection. The stirring events of the war period were many. Naturally New York was a focal point. The bogus Presidential proclamation calling for 300,000 additional troops, regarding which Telegraph Age has published voluminous matter in so far as it affected the telegraph, created much excitement. Also, I well remember the draft riots and the reign of terror created, in the thick of which I was a spectator, spending one night in the house of Judge Dean on Madison avenue, into which when passing I was invited as a measure of safety by its owner, and from which point we watched first the plundering and subsequently the burning of the dwelling near by of the port warden of New York.

When my old friend, Martin Van Buskirk Finch, of Albany, who was the agent at that point of The Associated Press, and a close friend of D. H. Craig, the founder and general manager of that association, as well as of our mutual friend, A. A. Lovett, came to New York to accept the managership of the main telegraph office at 145 Broadway, I was restored to my former position on the Washington wire. This was a place much to my liking, and I continued to hold it for a long time until obliged to relinquish it on account of the severe and prolonged illness of my wife which terminated fatally.

George B. Prescott, my former co-worker in Springfield, Mass., was president of the Gold and

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Stock Telegraph Company in New York. This company was seeking to introduce into public use a telephone of their own design. In this effort I became enlisted. At that time the telephone was regarded more as a toy than an instrument of utility having any practical and commercial value. Consequently the proposition I sought to lay before New York business men in its behalf met with scant consideration. It must be admitted in the light of the subsequent development of the telephone and the methods employed governing its use that the crude instruments of that day had about as little to recommend them as the plan of operation proposed. The latter was to build lines where required, connecting different business offices, sell them outright to users, they in turn to lease them to the selling company, who would undertake their operation.

Years before, when located at Springfield, Mass., I had known Samuel J. Burrell, who at that time worked the House printer at the New York end of the Boston line. He had an office on Broad street, and was the owner of a printer that was really a good instrument. He made an earnest move to secure its adoption among downtown business men, in which I engaged to assist him, the general proposition being much the same as that urged in behalf of the telephone referred to. But in this case, as in the other, we were doomed to failure. An offer at this time coming from Boston, there to operate a Phelps motor printer on the New York wire, received my prompt acceptance, and I forthwith became a citizen of the modern Athens, where I have since resided. The position then entered upon I continued to hold until 1901, when I retired permanently from the service, the printer which I had worked being abandoned. I, as well as William Blanchard, the other printing operator, became the recipient of a pension from the Western Union Telegraph Company. This bestowal, which was marked by kindly consideration and good will on the part of the company officials, and which has been deeply appreciated, inasmuch as it has enabled me in my old age, when incapacitated for work by illness, to live in contentment, with modest desire and relieved from distress.

As I recall in retrospect the "forms and scenes of long ago," how quaint and old-fashioned seem the workings of the telegraph of my youth compared with its subsequent evolution and mighty volume and rush of the present-day business and governing methods! On Sundays the old New York, Albany and Buffalo Telegraph Company did not open its doors for business. As a result the Monday morning editions of the Albany newspapers, although members of The Associated Press, were shorn of much of their accustomed telegraphic news. This was a source of chagrin to such men as Jacob C. Cuyler, editor of the Express, and Mr. Johnson, editor of the Atlas and Argus. I was enabled to partly overcome this deficiency when I obtained permission from my superintendent, A. A. Lovett, to make an arrangement with Mr. Harrington, the Springfield, Mass., operator to send me a synopsis of the news going from New York to Boston. In this way I managed to furnish the Albany papers with news items, for which service I received the magnificent remuneration of $1.50 from each paper, a sum which I divided with Mr. Harrington.

Old men, you know, like to revert to the past, for it is an atmosphere in which they dwell more frequently than that of latter-day events. I was, of course, during the earlier stages of my career brought in ultimate touch with many printing-telegraph operators. As a rule they were a fine body of men, intelligent, high-minded, faithful, and in the better meaning of the term, gentlemen, Some of them have been named already in these sketches, and at the risk of repetition I recall at random the following: Rufus B. Bullock, who afterwards became governor of Georgia, and subsequently a government commissioner of the Union Pacific Railroad; James N. Ashley, manager of the Boston office of the Commercial Telegraph Company, who afterwards became associated with the American, and later assistant at New York of Superintendent A. A. Lovett; H. C. Bradford and Frank Ashley, at Providence, R. I.; Harry Lloyd and Thomas Slack, of Boston, and Edward Gibbons, New York and Boston. I remember Henry Bishop, of New York, who went to London to operate the Hughes printer, but who returned after a short stay abroad. He worked the House printer with me on the Washington wire.

The list goes on: J. C. Hinchman, M. S. Roberts, J. G. Tobey, of Boston, Springfield and New York; Samuel J. Burrell, New York; John Selden, New York and Springfield; John Murphy and Mr. Harrington, whose first name I forget, at Springfield; Thomas Miler, of Boston, Springfield, Hartford and New York; Thomas P. Scully, now living in retirement in Brooklyn.

I knew Charles and Gilbert Simmons, of New York, the latter also working in Philadelphia; William Blanchard, Boston, Springfield and New York, who is now dead, and Charles Blanchard. Both of the Messrs. Blanchard, in company with a brother of A. A. Lovett, went to California to introduce the House printer on the Pacific Coast, but their efforts in this matter were unavailing; Charles became interested in the fire-alarm business, and William went into mining, but both were glad to return East. Then there were Joseph Knittle, of New York, now retired and living in Brooklyn, and Theodore Fullon, who divided his time largely between New York and Boston. There are three names that stand out distinctly in my memory and in my regard, for I knew and loved them well for their many excellent qualities of mind and heart—Fred J. Grace, John K. Calvert and Joseph L. Edwards. At the office of The Associated Press, New York, were Oliver Bradford and Fred Barber. On the Washington

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printer there were A. B. Talcott, the manager at Washington; Charles B. Noyes, whom I might designate as being "at large" he worked in so many different places; Fred W. Royce, Washington; J. P. Filer, A. J. Lombard, Richard Megenhardt, at Baltimore. Besides these there were Robert Black, George Snyder, Jacob Woodruff, H. E. Thayer and others.

This is a long list and might be extended, for as I write other names rise into recollection, but my story is told. If I have unconsciously made any errors of statement attribute it to a possible faulty memory. I rejoice that I was able to serve the telegraph. My life as passed in its service has had its vicissitudes, but as I muse over the past, as I frequently do, I would not change the course of events, for probably all things were ordered for the best.

Telegraph Literature for Telegraphers.

The American telegraph operator cannot complain of a lack of telegraphic literature, the purport of which is to afford him guidance and practical help in successfully pursuing his profession. While, of course, the best school in which to learn the rudiments of the art of telegraphy is the telegraph office itself, where theory, which though plausible, if often at fault, has no place, but where actual practice is always a visible and concrete operation, yet the science of telegraphy can only be acquired by its careful study. For this purpose books treating on the subject are necessary. Yet books are of but little value to the student who is really desirous of acquiring knowledge and a perfect understanding of his vocation, unless they impart information of a character thorough in its treatment of detail, stating fundamental facts and great truths in a manner that the average reader will readily grasp and profit by. A writer who has comprehensive and practical knowledge of his subject, based on personal experience, who thinks clearly, and is enabled to convey his thoughts and meaning intelligently to a receptive mind eager for information, possesses an enviable gift. Fortunately for the telegrapher who would seek a higher acquaintance with his calling through study, there are a number of writers, telegraphers themselves, men of fine intelligence, frequently still in active work, who have written on the great subject of telegraphy in a manner such as to render their names in effect as household words. The earnest student in telegraphy need never be at a loss for a helpful text book. There are numerous volumes extant, revised and brought down to date, any one of which should be a valuable possession. Such authors as William Maver, Jr., Francis W. Jones, Willis H. Jones, William Finn, Thomas D. Lockwood, Minor M. Davis, Charles Thom and Jesse Hargrave, all living personalities, have contributed to the literature of the telegraph in a manner that has created a wide and apparently never-ending demand for their writings. The subject of the telegraph has been considered from every point of view, and no library of a telegrapher can be considered complete without the several books of these authors on his shelves.

Women Telegraph Operators in India.

Consul-General William H. Michael, of Calcutta, writes that the government of India, acting upon the recommendation of the telegraph committee, has authorized the employment of women operators. He adds:

The candidates must be between eighteen and thirty years of age and they must be unmarried or widows. They must undergo a training of twelve months in the telegraph training classes, during which time they will receive $6.65 a month, the same allowance that is drawn by male learners. Selected candidates, on leaving the training classes, will be on probation for one year. On appointment they will receive the following pay: At stations in India other than Rangoon and Madras, $13.35 a month, increasing by annual increments of eighty cents, commencing with the four year of service, to $26.65; at Rangoon, $16.65, increasing to $30; at Madras, $10, increasing to $23.35. Service will be pensionable, and there will be no liability to transfer; but resignation will be compulsory in the event of marriage. The hours of work of women operators will be from 8 a. m. to 9 p. m., but the whole period of duty will not exceed seven hours in the twenty-four, and there will be exemption from duty on Sundays.

Book Review.

"The Hughes and Baudot Telegraphs," by Arthur Crotch, of the engineer-in-chief's department of the English post office (controling the telegraphs in that country), has made its appearance, from the press of S. Rentell & Co., Ltd., London. The volume, which numbers eighty-four pages, contains a very full description of the two type-printing telegraph systems used so generally in Europe, the Baudot in France and the Hughes elsewhere on the Continent. The illustrations are numerous and clear, and all together, the book furnishes a fund of carefully stated information valuable to the student and also of interest to the lay reader. This book may be obtained of J. B. Taltavall, Telegraph Age, 253 Broadway, New York, and will be sent to any address, carrying charges prepaid, on receipt of price—seventy-five cents.

The McGraw Publishing Company, of New York, publishers of the Electrical World, the Street Railway Journal, and other papers, has extended its field of electrical journalism into that of telephony by the recent purchase of Sound Waves (monthly), of Chicago, and the American Telephone Journal (weekly), of New York. These two papers have been consolidated under the name of the latter and will be issued weekly, the first number having made its appearance on February 22.

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Radio-Telegraphy.

A new wireless telegraph station at the Mores, Havana, has just been completed, the tower having an altitude of seventy-five meters. A new station has also been constructed in Santa Clara, and stations are in course of construction at Camagnez and Santiago de Cuba.

It is now proposed to transmit standard time by wireless telegraphy. Such a plan seems feasible In the near future suitably equipped ocean-going craft, and land stations as well, will no doubt receive standard Greenwich time transmitted from some central wireless station.

In the English House of Commons the Postmaster General has stated that the wireless telegraphy convention would have to be ratified by the government, and notice of the reservation of the right of exemption of stations given, before the end of March.

It is announced that an extensive wireless telegraph receiving and transmitting station is to be constructed at the base of the Eiffel Tower, Paris, where an elevated station has been established for some time past. It is stated by Reuter's agency to be the ultimate object of the new station "to render possible wireless communication between Paris and New York."

A remarkable instance of wireless telegraphic communication has been verified at the Bureau of Equipment, Navy Department. A wireless station at Point Loma, near San Diego, picked up the Connecticut, then talking off the coast of Cuba, took down the message and also picked up a message sent from the wireless station at Pensacola, Fla. Experts are wondering whether the message went across the continent or in the other direction around the world.

J. G. Opp, manager at Montreal, Que., of the Marconi Wireless Telegraph Company, states that it is the intention of the company to extend the service to include commercial as well as press messages, and that offices will be opened in other cities of Canada within a short time. A flat rate of fifteen cents per word is charged for commercial messages, this rate covering transmission over the land lines from Montreal to Glace Bay, and from Clifden, Ireland, to destination of message. It is not the present intention of the Canadian-English company to have American business transmitted through the Montreal office, owing, it is stated, to difficulties in land line facilities; but the erection of a station is contemplated in the United States, possibly in the vicinity of New York, for the benefit of the American public.

President Roosevelt in a message to Congress has urged early legislation for the protection of government messages transmitted by wireless telegraphy. The restrictions suggested for enactment into law are intended to apply in times of peace, as during times of war more radical regulations can be put into effect without legislation by means of executive proclamation as a belligerent right of the President. In a letter from the Secretary of the Navy accompanying the message, it is stated that on frequent occasions important messages from war vessels were interfered with and held up for a considerable time by the working of commercial wireless stations. The department asks that it be made a punishable offense to originate or transmit a false message purporting to be official; to break in and interfere with any wireless station while it is transmitting an official message; to refuse to cease or to fail to cease sending a private wireless message when called upon to do so by an operator having an official message to be sent.

The invention of a new system of wireless telegraphy with continuous waves is attributed to Egbert von Lepel, of Berlin, and a successful demonstration of its use was recently given between Reinickendorf, near Berlin, and Brunswick, a distance of 142 miles. It is stated that the essential characteristic of the generator is represented by an entirely new kind of electric discharge between metallic electrodes, and that for a given output it only weighs about one-tenth as much as the Poulsen apparatus, and is more economical in the consumption of energy. It is proposed to make experiments over a greater distance in the near future, and also to make more extensive tests with the same system in connection with wireless telephony. The inventor, who is only twenty-six years of age, was formerly a lieutenant in the army, was employed as an erector by the Allgemeine Company, and was afterwards engaged as an engineer by the Berlin Wireless Telegraphy Company. He was employed by the latter on the staff of Admiral Rezhdestvensky during the Russo-Japanese War, and had the honor of submitting technical reports to the German Emperor and of receiving his Majesty's written acknowledgements. Herr von Lepel has more recently conducted experiments in his own laboratory with a new kind of receiving apparatus for wireless messages, and carried out the work in connection with his new system for the production of undamped oscillations.

Edison Moving-Picture Litigation.

It is announced that an arrangement has been made with moving picture manufacturing interests and concerns which rent machines whereby all litigation relating to Edison patents will be withdrawn. The arrangement is in the interest of the Edison Moving Picture Company, and it is stated by the president of one of the large companies entering the combination that $1,000,000 would be a conservative estimate of the annual returns to Mr. Edison on the moving-picture patents now that his rights are conceded. We understand that Mr. Edison's personal benefit from the arrangement will approach $150,000 per annum.

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New Printing Telegraph at the United States Capitol.

BY WALDON FAWCETT.

(From the Western Electrician.)

Officials of the Congress of the United States and all those holding administrative positions at the capitol at Washington have become enthusiastic advocates of recent years of the advantages of electric power. The current, generated in an up-to-date plant in the basement of the big building, is employed for every purpose to which it is adapted and its use will be still further extended upon the completion of a new plant designed to provide light and power for the capitol and its two annex structures—the new office buildings for the use, respectively, of the members of the Senate and House of Representatives. The first of these annexes—the new $3,000,000 office building of the House of Representatives—has been completed within the last few weeks and is being linked to the capitol by various electrically operated communicative systems.

Of especial interest are the operations of a printing telegraph, with which experiments are being conducted with a view to providing a system for recording the doings of Congress and transmitting the chronicle to points more or less distant. By the aid of the new installation a brief record of all that transpires in the legislative halls can be transmitted instantaneously to Congressmen engaged in remote committee rooms or detained in their private offices, one-third of a mile distant from the scene of activities. At the outset the scope of this new "intelligence transmission system" is limited to the capitol and the new office building of the House of Representatives, but if the device does all that is expected of it the sphere of usefulness will be extended to include the Senate office building, now under construction, and all the principal government departments, some of them occupying buildings situated several miles distant from the capitol.

The provision of the new $3,000,000 building south of the capitol, said to be the largest office building in the world, with offices for the 400 representatives in Congress, was directly responsible for the introduction of this new time-saving device. For years past there has been a growing realization of the need of some communicative system that would more closely link the various parts of the legislative headquarters, and once provision was made for outside office quarters for the members of the Senate and House of Representatives this need became imperative. Most of the lawmakers will henceforth spend a considerable portion of their time in the private offices or committee rooms of the new office buildings, and it is essential that they have means at hand to keep momentarily in touch with all that transpires on the floor of the legislative chamber to which they are accredited.

Mr. Elliott Woods, superintendent of the United States capitol, gave much study to the subject and finally decided to make a trial of the printing telegraph as the communicative system most likely to meet the demands at the capitol. The system as installed consists of a sending station, in charge of an operator, and three receiving stations which are, of course, entirely automatic in their operation. One of the receiving stations is located in the new House of Representatives office building and the others are in the capitol proper. The system has been purposely restricted in scope until its fitness for the work in hand has been fully demonstrated. Then the number of receiving stations can be multiplied to any extent desired. Upon the formal adoption of the apparatus the base of operations, or sending station, which is now in the basement of the capitol, will be removed to a room adjacent to the office of the speaker so that the operator can receive bulletins for transmission with the utmost promptness. The statements to be transmitted by the printing telegraph will be prepared by the journal clerks of the Senate and House of Representatives and nothing will be transmitted by the machine save an official transcript of the proceedings of the two Houses of Congress.

The printing telegraph which has been selected for use at the capitol is the invention of John Burry, of New York, electrical engineer of the Stock Quotation Company. It has the keyboard arranged with letters and numerals in a double circle. In accordance with the latest approved practice a "dummy" receiving instrument is installed adjacent to the sending apparatus so that the operator has visible evidence at hand of the result of his work and can correct any mistakes or supply any omissions before the error has had time to make trouble. This facility for checking up the work as it progresses is of the highest importance in serving Congressmen who must have information of absolute accuracy.

The messages, which are transmitted simultaneously to any number of receiving stations, are printed in typewriter characters on paper of the width of ordinary letter paper. The paper unwinds from a roll and at intervals a section is cut off and bound with its predecessors in a file near at hand. This phase of the operation is of importance in the congressional work, it being designed to have the bound sheets constitute a complete skeletonized record of all that has transpired at the capitol during the day. Thus, a member arriving at the legislative headquarters late in the afternoon of a day on which Congress is in session can, by glancing through the cumulative bulletins at any receiving station of the telegraph, quickly familiarize himself with all that has occurred up to the minute of his arrival.

The primary purpose of the new system on Capitol Hill is to link the historic building with its two large "additions," but ultimately the receiving stations of the printing telegraph will, if the system is approved, be extended to embrace the White House and the various government de-

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partment buildings in Washington so that Senators and Representatives visiting the departments or the executive offices while Congress is in session can keep in touch with developments at the capitol. With such facilities every member can follow closely the measures in which he is interested and be on hand when a vote is taken.

Obituary.

William S. Humes, an old-time telegrapher, and a member of the United States Military Telegraph Corps, died recently at Altoona. Pa.

Bernard J. McSorley, a well-known telegrapher in the sixties, died in Philadelphia, February 18. For many years he was connected with the General Electric Company in the city of his residence.

F. H. Duncan, manager of the Postal Telegraph-Cable Company, at Trenton, N. J., and a member of the United States Military Telegraph Corps, died February 7 after a long illness at that place.

Ernie Lynn, aged twenty-eight years, a Western Union operator at St. Paul, Minn., died at his home in Eau Claire, Wisconsin, on February 6. He was a well-known telegrapher and had worked in many brokerage offices.

John Luxon, a well-known telegraph operator, died at Worcester, Mass., January 29. He was a native of Port Hope, Ont., and was fifty years of age. For some time he was employed by the Canadian Pacific Railway's Telegraph at Montreal, Later he entered The Associated Press service at Bridgeport, Conn., and since 1903 had been day operator at Worcester, Mass., for that association.

James C. Minahan, aged fifty years, of Albany, N. Y., died at Baltimore, Md., on February 14. Born at Troy, N. Y., he entered the employ of the Atlantic and Pacific Telegraph Company at that point as a messenger in 1870, and soon rose to become an expert telegrapher. In 1889 he became manager of the Municipal Stock and Telegraph Company at Albany, of which he acquired a controlling interest. He was identified with numerous business interests at Albany.

John F. Randolph, treasurer of the various Edison companies and private secretary to Thomas A. Edison, shot and killed himself at Orange, N. J., on February 17, while believed to be temporarily insane, insanity having previously developed among other members of his family. Mr. Randolph was forty-five years of age, and had been associated with Mr. Edison for thirty years, entering his employ as an office boy. Mr. Randolph was not financially involved in any way. He was a man well-known in telegraph circles.

Frank Adams, a forty-niner of the telegraph, died at his home in Akron, O., on January 22, aged eighty-eight years. He was born at Windsor, Vt., July 5, 1819. He took charge of the telegraph office at Akron in March, 1849, John A. Townsend, now living in retirement at Yonkers, N. Y., being messenger boy, and who subsequently and for fifty-three years served as manager of the Western Union Telegraph Company, at Dunkirk, N. Y., Mr. Adams' appointment as postmaster of Akron soon following, the telegraph office was removed to that of the post office. Abandoning the telegraph, for many years Mr. Adams engaged successfully in the manufacture of sewer pipe and was prominent as a public-spirited citizen in the affairs of his home town.

James D. Layng, a well-known railroad man, a director in numerous corporations, a former president of the Big Four Railroad and later president and general manager of the West Shore Railroad, died at his home in New York after a lingering illness, on February 12, aged seventy-four years. Mr. Layng was a competent telegrapher, and at one time had a private wire connecting his residence with the Western Union office at 195 Broadway, which he worked himself. In the early days of his career he recognized the advantages that could be derived from the use of the telegraph in connection with the railroad service, mastered the dots and dashes, and although the register was generally used in those days, he read by sound from the very first. Mr. Layng held an important place in the relation of railroads to the government during the Civil War, being in charge of the movements of large bodies of Federal troops. He had charge of the special train conveying President Lincoln to Washington to his first inauguration.

Ernest Jeunet, a well-known telegrapher, died at his home in Franklin, Pa., February 18. He was sixty-four years of age, and was a native of France. He came to America in 1854 with his father and located at Meadville, Pa., where he later learned telegraphy. He entered the Union army as a military telegrapher about 1863 and saw active service at the front in that capacity. After the war he served as operator with the Western Union Telegraph Company at New York, and late in 1865 was appointed manager of the Franklin office and given general supervision of the company's interests in that section. With the exception of a year spent with an oil broker at Oil City, Pa., Mr. Jeunet served as manager of the Western Union office at Franklin until 1892. In 1895 he was elected city clerk and city tax collector of Franklin, and was re-elected to those positions each year for ten years. Surviving him are two sons and two daughters. E. Alexis Jeunet, U. S. A., who served with the Signal Corps at Havana in the Spanish-American War, and later as a lieutenant in the 26th Infantry in the Philippines, and who has recently been selected by the government to have charge of the establishment of government wireless telegraph stations in Alaska; Achilles A. Jeunet, who has been manager of the Franklin office of the Western Union since January, 1905, and Miss Zeline and Miss Leontine Jeunet, of Franklin.

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Letters from our Agents.

DALLAS, TEX., WESTERN UNION.

"It is an ill wind," etc. The storms at the north have driven quite a good deal of business out of its usual route and we have taken care of our share of the relaying to both coasts, New York and Los Angeles both having direct wires to Dallas. It is pretty hard to produce a storm that leaves Dallas with no outlet, this city being the center of such a network of railroads. If all means of wire communication fail we still have the wireless out at the fair grounds. Dallas is fast becoming "the" relay point of the Southwest. It is said that the chief operator in New Orleans when asked why it was so dull there, remarked: "Dallas is getting all the relay business."

J. P. Patton, formerly manager at Shreveport, La., is now in charge at the "news" office.

H. P. Bond is now day wire chief, and Roy Delay, night.

A. L. Burns, accompanied by his wife, has just returned from a visit at his home in Altus, Okla.

B. F. Leland is away on leave of absence and has gone to his home in Washington C. H., Ohio.

A. G. McGalin, one of the day wire chiefs, has installed telephones at Dallas, Ft. Worth and Houston. The every day convenience of this must be seen to be appreciated. The device has a "howler" instead of a bell and interferes in no way with a quad and permits of a better understanding of a situation than a good many times the amount of words in "Morse." Mr. McGalin is also working on a repeater which does entirely away with the "transmitter" or repeating sounder, and which, like Mr. Barclay's famous direct point repeaters, can be used without a local if desired.

DULUTH, MINN., WESTERN UNION.

F. E. Smith, formerly employed as chief operatro in this office, but later by this company and The Associated Press at Spokane, Wash., has returned to accept the position as night chief.

William Glibbery, manager of the night watch system here, called up the watchman at the ore docks recently and told him he had not turned in his boxes. The watchman replied that he had turned them in, but the signals must have fallen off the wire, because there was a bad bend in one of the poles at the corner of Fifth avenue and Superior street.

NEW YORK, WESTERN UNION.

W. Snead, chief operator of the Great North Western Telegraph Company, at Winnipeg, Man., paid us a visit recently and was escorted throughout the building by Traffic Chief E. E. Brannin.

F. Demski, night traffic chief, city department, has fully recovered his health after a long siege of illness due to a severe surgical operation, and has returned to duty.

H. J. Pearce, son of Chief Pearce, has accepted a position on the day force with The Associated Press in this city.

J. I. Conklin, one of the veterans of the office and a member of the all night force, died suddenly on the morning of February 12 from acute Bright's disease. Mr. Conklin had perfected several inventions in connection with telegraphy and was well liked for his genial disposition.

The sympathy of the force is tendered to E. Mesler, of the Eastern division, who has suffered a double affliction in the death of his wife and of his only sister, both having passed away within a few weeks' time.

T. C. Haley, aged thirty-nine years, connected with the delivery department, died on February 9, of pneumonia.

Harry E. Bennett, chief of the newspaper division, who reached his forty-sixth birthday on February 10, died two days later at his home in Brooklyn, after an illness dating from October, 1907. Mr. Bennett came to this country from North Wales when a child, and in 1888 became associated with this company, continuing in its service during the remainder of his life. He was a man very generally esteemed for his fine traits of character and for his abilities as a telegrapher.

OTHER NEW YORK NEWS.

The New York Telegraphers' Aid Society make their statement for the quarter ending December 6, 1907, as follows:

Balance on hand December 6, 1907		$20,037.56
Receipts		1,386.00
Total		$21,423.56
Disbursements.		
Sick benefits	$775.30	
Death benefits	200.00	
Expenses	166.60	
		$1,141.90
Balance on hand December 6, 1907		$20,281.66
Summary.		
Receipts		$1,386.00
Disbursements		1,141.90
Gain for quarter		$244.10
Relief Fund.		
Balance on hand September 6, 1907		$4,008.00
Receipts		95.00
		$4,103.00
Disbursements		110.10
Balance on hand December 6, 1907		$3,992.90

Balances.

Aid Society	$20,281.66	On deposit	$24,110.06
Relief fund	3,992.90	Cash on hand	**164.50**
Total	$24,274.56	Total	$24,274.56

J. H. Driscoll, W. T. Rogers, F. J. Nurnberg, auditors.

Assessment No. 475 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of Joseph S.

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Bough, at Visalia, Cal.; John M. Fairchild, at Stockton, Cal.; Joseph W. Kates, at Manchester, Va.; William F. Noonan, at Edgewater, N. J., and George F. Randolph, at Brooklyn, N. Y.

Stock Ticker System.

A patent has been issued to Mr. John C. Barclay, assistant general manager and electrical engineer of the Western Union Telegraph Company, on an improvement in stock-ticker systems. The purpose of the invention is to provide means whereby the transmitter of a stock-ticker system in one city or locality may operate a similar system in another city or locality, the two systems being connected by a single line. The usual local transmitting and translating devices are employed, in combination with polar and neutral relays, which relays regulate the electrical impulses transmitted to the line as to sequence, duration, etc. As the impulses are received they are differentiated by means of similar instruments, thus causing the receiving instruments to perform their various operations.

General Mention.

In renewing his subscription recently H. J. Brown of the office of Superintendent E. B. Saylor, of the Western Union Telegraph Company, Pittsburg, Pa., said: "Always count me as a subscriber to Telegraph Age. I am sure I could not and would not be without it."

A man purporting to be a telegraph operator was allowed to use the wire in the Tuscumbia office lately and "wired" to a local bank an order for $200, which the bank paid. The man, calling himself, W. R. Russell, escaped, but was afterwards arrested in Pulaski, Tenn.

Mr. C. F. Annett, Jr., of Nampa, Idaho, a son of Charles F. Annett, manager of the Western Union Telegraph Company, at New Haven, Conn., who has become a recent subscriber to this journal, writes: "I take great interest in reading Telegraph Age. It is in every way a fine paper, instructive and full of information."

The general meeting of the electrical committee of the Underwriters' National Electric Association will be held on March 25 and 26 at the rooms of the New York Board of Fire Underwriters, 32 Nassau street, New York City. The sessions will open at 10 A. M. Mr. C. M. Goddard is secretary, with offices at 55 Kilby street, Boston. The meeting is an important one to electrical interests, as some revision of the rules of the National Electrical Code will be considered. The telegraph companies are usually represented at these meetings.

Miss Mary Bannon, a telegrapher, told a coroner's jury at Altoona, Pa., on February 15, that she was responsible for a wreck on the Cresson and Clearfield Railroad, occurring on February 10, in which John E. McNellis, an engineer, lost his life and seven other persons were seriously injured. Miss Bannon was operator at the tower at Kaylor. She said that she had received orders to hold one train on a siding until another had passed, but became confused and transmitted wrong instructions to the operator at Cresson.

The general manager of the Pennsylvania Railroad system has requested all departments to exercise the utmost discretion in using the company's telegraph lines to reduce as much as possible the number of messages sent each day, as well as to secure better attention to messages of importance. New forms of envelopes have been printed for special delivery messages to be forwarded by train mail service, and, whenever possible, this form of message will be used instead of telegrams. In 1904, when a similar notice was issued, a reduction of about 2,000 messages a day was made at the main telegraph office at Philadelphia. Since January 1 a reduction of about 1,500 messages has already been effected at the main office in the Broad street station.

The optimistic man is the successful man. The best way to become optimistic is to establish a bank account and own a home. It is surprising how quickly satisfaction and success follow confirmed habits of saving. The Serial Building Loan and Savings Institution, 195 Broadway, New York, would like to talk with telegraphers in respect to these matters.

Advertising will be accepted to appear in this column at the rate of three cents a word, estimating eight words to the line.

Will buy or sell, in one to ten share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

Rubber Telegraph Key Knobs.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

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Leg Pattern $3.50
Legless Pattern 4.00
F.O.B. Columbia, Pa.

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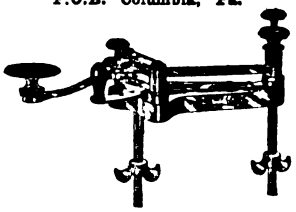

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Send draft, express or P. O. money order.

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North American Telegraph Co., H. A. Tuttle, general manager and purchasing agent, Minneapolis, Minn.

Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

Postal Telegraph-Cable Co. of Texas, S. M. English, general manager and purchasing agent, Dallas, Tex.

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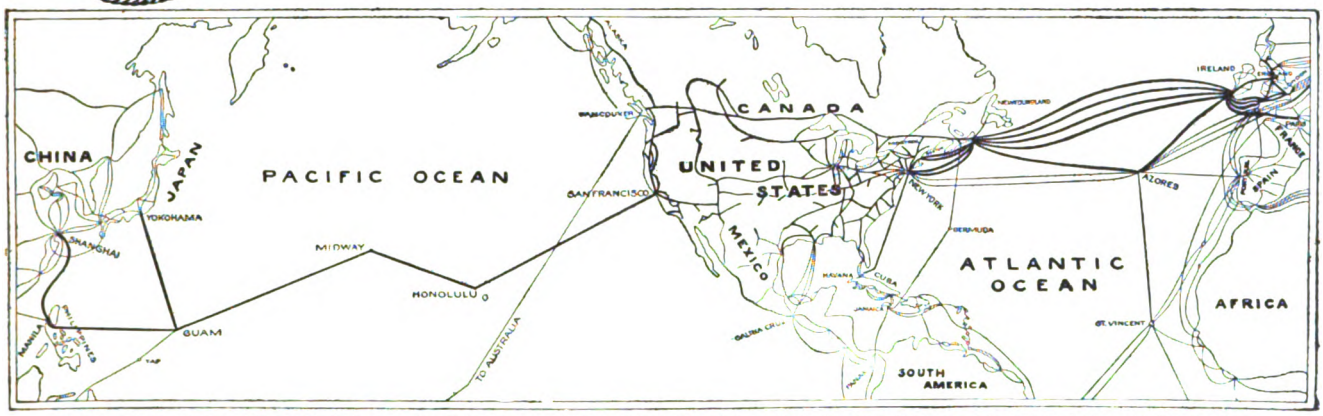

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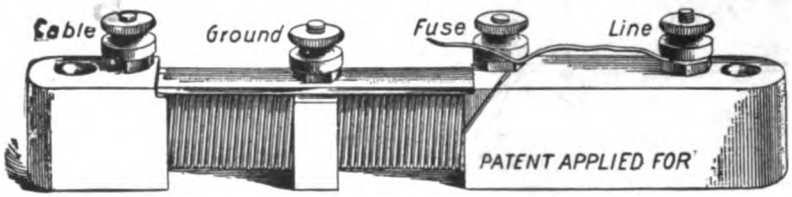

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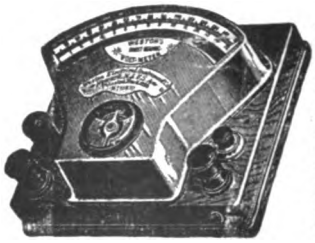

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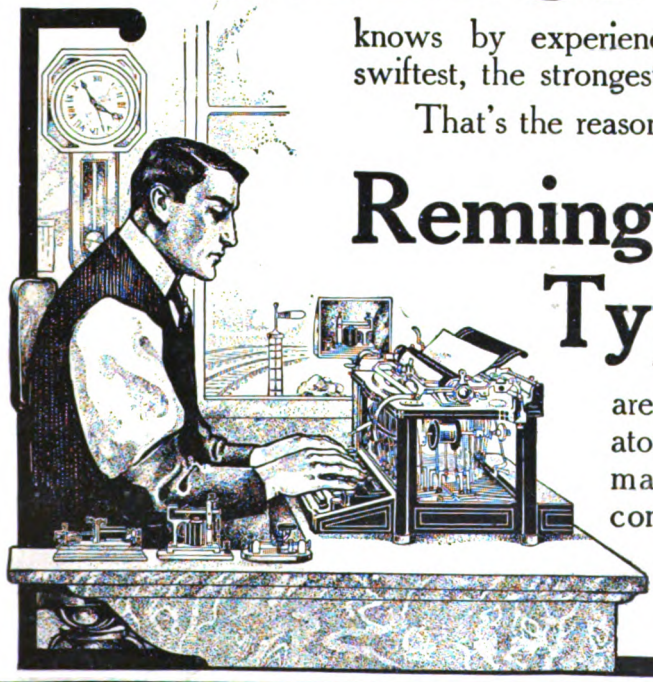

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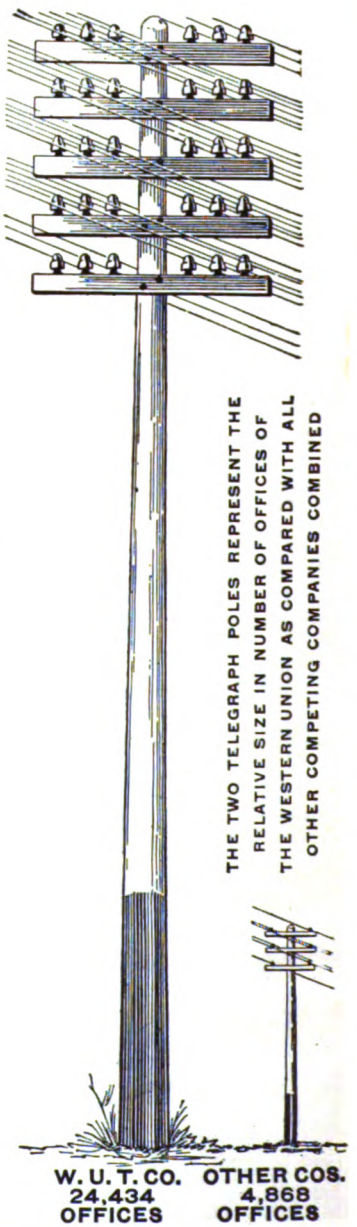

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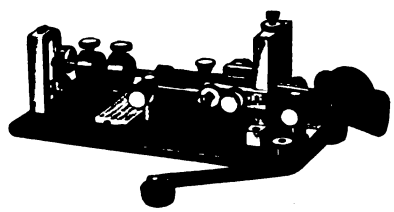

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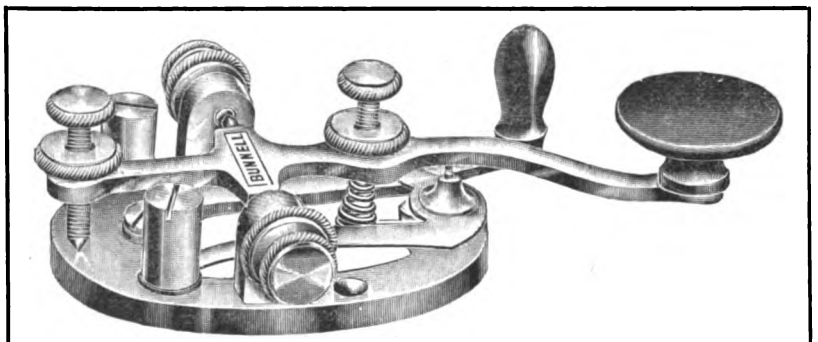

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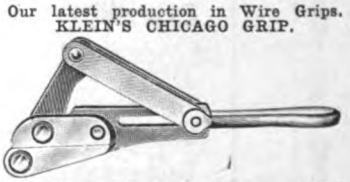

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A New Quadruplex Apparatus.

BY WILLIS H. JONES.

Since Edison invented the so-called "bug-trap" which places the receiving sounder in a local circuit controlled by the lever of a repeating sounder, the latter itself being in direct control of the armature lever of the neutral relay, there has nothing so far been offered which possesses sufficient merit to warrant a permanent substitution therefor.

Mr. John J. Ghegan, president and general manager of J. H. Bunnell and Company (Inc.), New York, an old time telegrapher and an inventor of considerable ability, now offers an arrangement patented by him, which he claims is far superior to the Edison instrument and which claim is vouched for by the electrical experts who have given the two devices a thorough competitive test on long and troublesome quadruplex circuits.

The accompanying diagram, Figure A, shows the theoretical arrangements of Mr. Ghegan's device.

The method of operation employed is to open or close the receiving sounder circuit for a fraction of a second by means of the actions of an induction coil, the primary of which is in the local circuit containing the lever and the contact points of the neutral relay, while the secondary is connected to the magnet of a pony relay, the local contacts of which are in the receiving sounder circuit.

The result of this arrangement is that a momentary opening of the local circuit containing the receiving sounder occurs during both make and break contact of the neutral relay's back stop contact point.

On first reflection one is inclined to fear that the apparent curtailing of the duration of contact while forming a dot due to such opening indicates the possibility of a weakness in the method, yet the results obtained do not apparently justify the doubt. It is claimed that the electrical effect

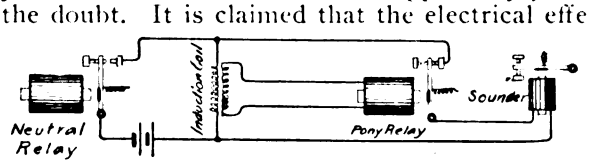

Fig. A.

created in the local circuit containing the receiving sounder by the operation of the induction coil, corresponds with, and follows more closely, the period, duration and characteristics of the line effect, than the air gap, which Edison's device provides to attain the same end, is capable of doing.

In Mr. Ghegan's original apparatus the primary of the induction coil circuit was opened by means of an additional lever attached to the neutral relay as shown in Fig. B. As may be seen by a glance at the diagram the manipulation of this extra lever is merely mechanical, depending as it does upon the opening and closing of the companion lever

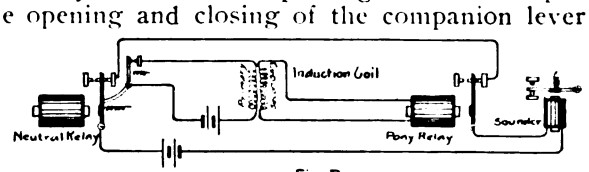

Fig. B.

against which its curved end rests for its operation.

In comparing results obtained by the original and the final arrangements, Mr. Ghegan says:

"With the former arrangement of pivoted lever for breaking the primary circuit it was found that sometimes in the event of very heavy 'kicks' being developed, there would occur a tremor in the sounder caused by a reversal occurring at the moment the neutral relay armature lever was leaving the back-stop, and therefore before the primary circuit containing the coil could be closed. With the new arrangement (Fig. A) this tremor is impossible, as the local circuit is momentarily broken when the neutral relay armature is leaving its back-stop as well as when it makes contact therewith."

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Another advantage obtained by this latter method is that it requires no special apparatus, other than the induction coil relay, for its operation. The usual neutral relay and apparatus being employed in their regular capacities and places, except the repeating sounder which is discarded altogether.

The only alteration in the connections of the standard quadruplex apparatus required is that

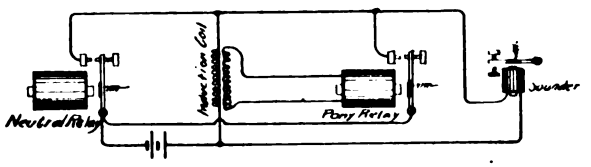

FIG. C.

when using methods shown in Figs. A and B the wires in the binding posts of the distant transmitter representing the "long" and the "short" ends, respectively, be transposed; that is to say, so connected that the short end current goes to line when the transmitter is closed instead of the long end.

The only directions given for obtaining best results is that the pony relay contact points be adjusted so that its armature will respond to both make and break impulses, while the local battery should be sufficiently strong to work the pony relay with a snap.

Another successful arrangement is shown in Figure C, in which the front contacts instead of the back ones are used on both neutral and pony

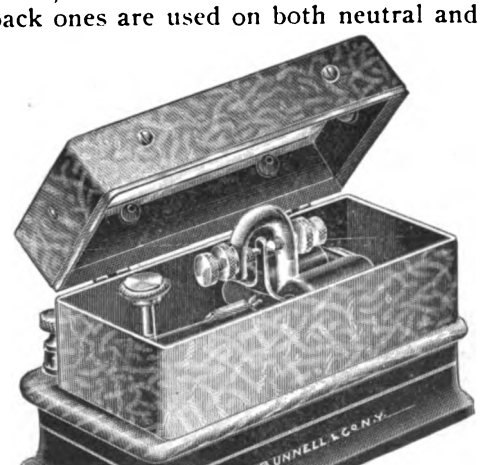

FIG. D.

relays. The contacts of the latter being connected in multiple with those of the neutral relay so that when the armature of the neutral relay is momentarily separated from its local contact by a reversal or other kick of short duration, the sounder is not affected thereby, because of the impulse from the induction coil causing the pony relay contacts to close for an instant and thus maintain the continuity of the local sounder circuit. This arrangement has the effect of slightly lengthening all dots and dashes, which is a decided advantage on long lines where the dots come in rather light on the neutral relay. In using method C the transmitter is not changed, but the local contact points of the home neutral relay are transposed so as to operate the sounder from the front stop as shown.

Figure D shows the complete instrument combining the pony relay and coil mounted in a dustproof case with hinged cover having a beveled plate glass top.

Recent Telegraph Patents.

A patent, No. 879,300, for a telegraph switchboard, has been granted to Albert T. Newman, of Greeley, Kan. Contacts for a number of circuits are arranged in the form of an arc on the board. A shaft passing through the board carries a bundle on one end and a disk on the other. The latter connects the different circuits.

A patent, No. 879,357, for a telegraphic transmitter, has been awarded to Clarence Brain, of Parsons, Kan. A series of spaced contact brushes has means for moving the brushes into operative relation with a series of contacts representing telegraphic code characters. Means are arranged for adjusting the space between successive active brushes to correspond to the time space of a telegraphic code character plus the separating time space between two characters.

A patent, No. 879,650, for electric transmission of intelligence, has been issued to Isidor Kitsee, of Philadelphia, assignor of one-half to William J. Latta, of Philadelphia. Means to shield receiving devices in a telegraph circuit from impulses induced through neighboring wires, comprise a direct shunt with practically no impedance but capacity for each of the electromagnetic devices, a ground for each of the shunts, in combination with a series of inductance coils distributed along the line, part of the coils provided with a direct shunt having practically no impedance but capacity.

A patent, No. 879,651, for electric transmission of intelligence, has been taken out by Isidor Kitsee, of Philadelphia. This method of making immune devices inserted in telegraph lines from neighboring power wires consists in causing to flow in the telegraph lines a prime current of the power wire of a force about equal to the induced current, but of opposite direction.

A patent, No. 879,711, for a telegraphic transmitter, has been obtained by Clyde Williams, Porter B. Mitchell and Sharpe Hathaway, of Barton, Ohio. The transmitter consists of an electromagnet, armature-carrying means, a contact point, keys and contact posts for the keys, and a pivoted plate coacting with the contact point to make and break the circuit through the armature, the plate having adjustable parts disposed on opposite sides of and operated by the armature-carrying means, whereby the period of duration of the break may be varied.

A patent, No. 880,044, for a transmitter, has been granted to Samuel W. Rothermel, of New

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York. A typewriter transmitter having a continuously rotating toothed cylinder with which gears having cams are adapted to be lowered selectively by depression of the keys.

The following patents have expired.

Patent No. 447,108, for a telegraph apparatus, held by J. A. Parker, of St. Louis, Mo.

Patent No. 447,166, for a telegraph transmitter, held by S. W. Smith, of New York.

Personal.

The English postmaster-general has appointed Sir John Gavey, C. B., late engineer-in-chief, to be consulting engineer to the telegraph department of the British post office.

The wife of H. Lee Sellers, of the firm of R. H. Sellers and Company, and who is also connected with the Telepost Company, New York, died at her home in Mamaroneck, N. Y., on Thursday, March 5.

Mr. R. N. Young, of Winnipeg, Man., assistant superintendent of telegraph of the Canadian Pacific Railway's Telegraph, accompanied by his wife, recently spent a few days in New York. The visit of Mr. and Mrs. Young was of a social nature and they were made the recipients of much kindly attention on the part of friends.

The recovery of Thomas A. Edison is said at the Manhattan Eye, Ear and Throat Hospital, New York, where he has been undergoing treatment, to be now practically assured. The fever which set in immediately after the operation for mastoiditis on February 23, has disappeared entirely, and fears are no longer felt that complications may develop.

Andrew Carnegie has performed a graceful act in coming to the financial assistance of Mrs. Henry Sanger Snow, of Brooklyn, New York, wife of the defaulting former treasurer of the New York and New Jersey Telephone Company. He has settled upon her the annual income of $25,000, amounting to about $1,700. At the same time he has paid her $1,500 outright. He was led to do this generous deed because of his kindly regard for Mrs. Snow's father, the late David Brooks, who was manager of the early telegraph office at Pittsburg, Pa., when the future millionaire as a boy applied to him for employment and began to earn his living at $5 a week.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. T. J. Cooper, manager of the Bay City, Mich., office, will go abroad on March 25, sailing from New York. He expects to be absent about ten weeks, during which time he will tour Europe. His place will be filled during his absence, by A. A. Patterson, repeater chief, at Toledo, O.

Dr. P. E. Murray, who was for a number of years assistant superintendent of the Western Union Telegraph Company at Atlanta, Ga., and who resigned about three years ago, has been appointed manager of the Western Union office at that point, to succeed Horatio Vandevender, resigned, to enter other business.

Mr. W. K. McClarin, assistant superintendent of construction of the southern division of this company, with headquarters in Atlanta, Ga., has resigned to enter other business. Mr. McClarin has been in the employ of this company for a number of years, commencing in a construction gang and working himself up to the position of foreman and general foreman, and was appointed assistant superintendent of construction in June, 1906.

Among the recent executive office visitors were: Superintendents E. B. Saylor, of Pittsburg; J. P. Altberger, of Philadelphia; C. F. Ames, of Boston; F. E. Clary, of New Haven, Conn., and D. C. Dawson, of St. John, N. B.; Managers W. A. Sawyer, of Buffalo; G. D. Butler, of Rochester; J. E. Bierhardt, of Syracuse; H. L. Waterbury, of Saratoga, N. Y.; A. E. Reynolds, of Schenectady; I. W. Copeland, of Troy; T. J. Meade, of Albany; J. B. Bertholf, of Jersey City; C. F. Annett, of New Haven; E. Ryder, of Hartford; H. J. Lockrow, of Newport, and F. E. Howell, of Utica. Some of these managers met Superintendent E. M. Mulford in his office where an informal conference was held.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

E. J. Nally, vice-president and general manager of the company, left town on March 10 for an extended business trip in the West, which will carry him as far as the Pacific coast. He was accompanied by H. F. Hawkins, assistant secretary of the company.

At the annual meeting of the stockholders held on February 25, the following directors of this company were elected: Clarence H. Mackay, A. B. Chandler, Edward J. Nally, Charles C. Adams, George G. Ward, E. C. Platt, Charles P. Bruch, J. W. Ellsworth, George Clapperton, C. R. Hosmer and Edward Reynolds.

At a meeting held by the directors on March 5, for the election of officers and members of the executive committee, the following were elected: Clarence H. Mackay, president; A. B. Chandler, chairman of the board; Edward J. Nally, first vice-president and general manager; C. C. Adams, second vice-president; C. P. Bruch, third vice-president; G. G. Ward, fourth vice-president; E. C. Platt, treasurer; T. L. Cuyler, Jr., assistant treasurer; John O. Stevens, secretary; Henry F. Hawkins, assistant secretary. Executive Committee—A. B. Chandler, G. G. Ward, Edward J. Nally, E. C. Platt, Charles C. Adams, Charles P. Bruch and Edward Reynolds, with the president ex-officio.

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A new restaurant designed for Postal employees will soon be opened in this building, and will be a much needed improvement. It will supersede the old restaurant and as it will be conducted under new management, the results are likely to command general approval. It will be in charge of Thomas J. Howlett, of Chicago, an experienced caterer.

The company will establish a new main office in Pittsburg, having leased space for that purpose in the Keenan Building, at the corner of Liberty street and Seventh avenue. The operating room will be located on the seventh floor, and will have abundance of outside light supplied through windows on all four sides. This will be one of the finest and largest offices in the entire Postal system, and in its finish and equipment will embrace all modern requirements. The premises were inspected on March 11 by Messrs. E. J. Nally, H. F. Hawkins, E. B. Pillsbury, division superintendent; Minor M. Davis, and F. E. d'Humy, respectively electrical engineer and assistant electrical engineer.

The Cable.

Cable communication was interrupted March 11 with:

Venezuela	Jan. 12, 1906.
Hayti	Jan. 18, 1908.
All offices closed to International traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.	
Ahvaz, Persia	Jan. 26, 1908.
Messages must be addressed "Ahvaz, Post Bushire," until further notice.	
Madura Island (Dutch East Indies)	Feb. 3, 1908.
Guadeloupe, Marie Galante and Les Saintes	Mar. 9, 1908.

Adolph Amann has resigned his position with the Commercial Cable Company to go into the real estate and insurance business at Arlington, N. J. Mr. Amann was employed by the Commercial Cable Company for fourteen years, eight of which he served in the office of Mr. George Gray Ward, vice-president and general manager.

International Telegraph Conference.

The International Telegraph Conference, which was to have assembled at Lisbon, Portugal, on April 2, but which was postponed on account of the assassination of the king, will be held at Lisbon on May 4.

The Railroad.

Mr. W. F. Williams, of Portsmouth, Va., superintendent of telegraph of the Seaboard Air Line Railway, accompanied by his wife, was a recent New York visitor.

W. I. Bliss has been appointed superintendent of telegraph of the New York, Chicago and St. Louis Railroad, with headquarters at Cleveland, O., vice R. W. Mitchener, promoted to the superintendency of the Cleveland division.

The March meeting of the Railway Signal Association will be held at the Great Northern Hotel, Chicago, on March 16, beginning at 10 A. M. The subjects to be discussed are the report on specifications for electric interlocking, beginning at No. 60; the report on specifications for automatic block signals; also the paper on storage batteries which was presented at New York in January.

The Lake Shore and the Lake Erie and Western railroads are making practical tests to determine the feasibility of using telephones instead of telegraph for train despatching. If these experiments succeed, it is said, the system will be instituted on all the New York Central lines. A number of short telephone lines have already been installed on the Lake Shore for use in despatching over short branches, but no attempt has been made to use the system on the main line. Considerable despatching is also done by telephone on the short divisions of the Michigan Central. The object of the change from telegraph to telephone is to cut down expenses.

The programme of many of the railroads regarding the use of the telegraph, rendered necessary by curtailment of business incident to financial conditions, and superinduced by adverse national and state legislation, varies, of course, according to locality and the needs of the service. Some of the conditions already decided on may be stated as follows: The abandonment of many stations as telegraph stations except division headquarters and junctional points; the substitution of telephones for the receipt and transmission of train orders and messages; the employment of women as agents in many stations thus transformed into telephone stations; the transaction of a large amount of office business by train letter, which formerly was transacted by telegraph; the rapid extension of the automatic electric block signal system, which will make telegraph stations largely unnecessary.

As has been previously announced, the Railway Telegraph Superintendents will hold their next annual convention at the Windsor Hotel, Montreal, Que., in June, the dates being the 24th, 25th and 26th of that month. There is a very general and pleasant impression abroad that this meeting, apart from its regular business functions, which will embrace numerous features of direct interest that are coming up for discussion, will be particularly attractive in its plan of social entertainment. It is hinted that Vice-President W. J. Camp, the electrical engineer of the Canadian Pacific Railway's Telegraph, aided by W. W. Ashald, of the Grand Trunk Railway system, have got their heads together and are "conspiring" to give their guests from "The States" a genuine good time. The plan in brief thus far arranged is that the members of the association will be taken on a trolley ride over the lines of the Montreal street railway. Then the Canadian

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Pacific Railway will provide transportation for an excursion from Montreal to Quebec and return. Besides this, the Richelieu and Ontario Navigation Co. has agreed to furnish transportation at half rate over any part of their system which the superintendents may desire to travel, either from Toronto or Kingston to Montreal, or for side trips to Quebec or up the celebrated Saguenay River. The committee on topics state that a list of the papers to be read at Montreal will be furnished at an early date. It will be published in this column. In the meantime anyone seeking any further information respecting the affair should address P. W. Drew, at Chicago, the secretary, and who is the superintendent of telegraph of the Wisconsin Central Railway Company.

The Nine-Hour Law Decision.

Announcement was made on Saturday, March 7, of the formal decision of the Interstate Commerec Commission as to the application made by railroads for an extension of time in which to comply with an act of Congress, at many stations covered by the sixteen-hour provision and at nearly two-thirds in the aggregate of the stations on the lines of the applicants to which the nine-hour provision relates. The petitions alleged in some cases inability to obtain the additional force required, and in most cases the financial hardship which the compliance imposes. An order was entered by the commission denying the petition in all cases.

It is held by the commission unanimously that to grant such wholesale orders of extension would interfere in effect with the policy of the legislation in its fundamental aspects and would amount to an amendment of the law by an official body charged with its administration. It was held further that to grant an extension on account of financial distress would open the door to endless uncertainties, because there is no possible means of determining the degree of financial distress which would justify extension, and if mere financial hardship is, in the language of the law, "good cause" for postponing compliance, it was equally good cause for refusal to pass the law.

Death of George W. Balch.

George W. Balch, a forty-niner of the telegraph, a native of Vienna, N. Y., died at his home in Detroit, Mich., on March 2. He acquired a practical knowledge of telegraphy in 1848. In early life he became identified with the O'Reilly telegraph interests, both at Detroit and Chicago, his telegraph connections leading him also into railway telegraph affiliations. By reason of consolidations Mr. Balch became connected with the Western Union Telegraph Company, and in 1865 was made assistant general superintendent of the company with headquarters at Rochester, N. Y. In 1866 he was transferred to the executive department of the company at New York, continuing there to act as assistant to General Anson Stager, and also for some months assistant to J. H. Wade, president of the company. In 1867 Mr. Balch's headquarters were removed to Buffalo, N. Y. Declining the superintendency at Chicago at that time tendered to him, he soon resigned and entered commercial pursuits at Detroit. Subsequently he embarked extensively in the construction of telegraph lines for the Western Union Telegraph Company in Michigan and Indiana. He also built some two thousand miles of lines for the Michigan Telegraph Company, of which he was president. Mr. Balch, with others, introduced the district telegraph into Detroit, and was also instrumental in introducing the telephone. For many years he was president of the Telegraph and Telephone Construction Company and president of the Michigan Bell Telephone Company. Of late years Mr. Balch divided his time between Detroit and New York, in both of which cities he had extensive business interests, in the latter being a member of the Produce Exchange. He acquired a large fortune.

Thomas B. Balch, aged forty-five years, son of George W. Balch, committed suicide on March 7, impelled to the commission of the rash act because of brooding over the loss of his father.

OBITUARY NOTE.

Victor H. MacCord, aged sixty-six years, a well-known old-time telegrapher, died in Linesville, Pa., on February 4. He learned telegraphy early in life, first becoming identified with the railroad service, but later taking charge of a commercial office at Pithole, Pa., at the time of the oil excitement. Abandoning telegraphy, he went to California, where he remained from 1867 to 1870, thence going to Peru. There he became general superintendent of the Southern Railway of Peru, a position he continued to hold until 1905, when he resigned to devote his time to personal interests. He represented this country as resident consul at Ariquipa, Peru, for many years.

A Useful Device.

The "Holdfast" relay springjack, an invention of practical value to all users of sending machines and portable keys, is shown in an advertisement on another page of this issue. This simple device is attached to the binding post of the relay, its construction permitting the insertion or withdrawal of any kind of wedge without interrupting the circuit. It also entirely eliminates all damage to keys caused by the prevailing method of forcing the wedge under the lip of the key; it saves the key and leaves it at all times free for use. This device is the invention of a press operator, a practical man daily engaged in the service, who has provided something so useful as to recommend it to the profession generally.

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Mr. Marconi on Wireless Telegraphy.

Mr. Marconi delivered his promised address on "Telegraphy Through Space, and Some of Its Commercial Applications" before the Chamber of Commerce at Liverpool on February 24. He said that his principal object was to explain what wireless telegraphy was, what it had accomplished, and how it could be further utilized in the interests of commerce and industry. One objection leveled against wireless telegraphy was that it was not possible to work more than a very limited number of stations in the immediate vicinity of each other without mutual interference or producing confusion, but, as in the case of land telegraphs, this could be obviated by proper organization and discipline. It was often an advantage that any station should be able to pick up a message not intended for it, as in the case of a ship in distress calling for assistance, but although in many instances untuned wireless telegraphy might prove of great utility, still it was clear that for ordinary commercial purposes, so long as there remained undiscovered some method of rendering stations completely independent of one another, a very important and effectual limit to the utilization of the system would be imposed. By the invention, however, of condenser circuits, constructed so as to have definite periods of electrical vibration, it had become possible to send different messages simultaneously and without interference, and methods for preventing interference were in actual successful use by the royal navy and on the principal liners which employed his system. The facility with which distances of over 200 miles could be covered by his apparatus as long ago as 1900, and the knowledge that by means of tuning devices mutual interference could be prevented, led him to decide on the construction of two powerful stations, one in Cornwall and the other in North America, to test whether, by the employment of much greater power, it might not be possible to transmit messages across the Atlantic. It had been stated at several meetings of shareholders of the cable companies that the electric wave would never succeed in getting round or through the mountain of water, over 200 miles high, which existed between this country and America. Toward the end of 1901, experiments were made between Poldhu and a temporary station near St. John's, Newfoundland, and on December 10, 1901, signals were received with unmistakable clearness at the latter from the former, a distance of about 2,000 statute miles. In February, 1902, readable messages were received on tape on board the steamship "Philadelphia," of the American line, up to a distance of 1,551 miles, and test letters as far as 2,099 miles from Poldhu. Experiments with Newfoundland could not be continued or extended in consequence of the hostile attitude of the Anglo-American Telegraph Company, but, owing to a generous subsidy of £16,000 from the Canadian government, a long-distance station was constructed in Glace Bay, Nova Scotia, and during the latter part of 1902 extensive experiments, which were greatly facilitated by the placing of a cruiser at his disposal by the Italian government, were carried on with Poldhu. It was then observed that intervening land or mountains did not considerably reduce the distances over which it was possible to communicate. Messages were received direct from Cornwall at points in the Baltic near Sweden; at Kiel, the North Sea, the Bay of Biscay; at Ferrol, Cadiz, Gibraltar, Sardinia and Spezia. In December, 1902, messages were exchanged between Poldhu and Glace Bay, but it was found that communication was better from Canada to England than in the opposite direction. This was due to the fact that, by reason of the subsidy granted by the Canadian government, the station at Cape Breton had been more efficiently and expensively equipped, while as regards Poldhu, owing to the uncertainty of what might be the attitude of the British government, his company was unwilling to expend large sums of money in increasing its range of power. In the spring of 1903 the transmission of news messages from America to London was attempted, and for a time these were correctly received and published in the London Times, but accidents occurred, and it was decided for the time being not to attempt the transmission of any more public messages until such time as a reliable and continuous service could be guaranteed under all ordinary circumstances. As he found that many important improvements evolved during the experiments could not be readily applied to the plant at Poldhu, it was decided to erect a completely new station at Clifden, in Ireland, for the purpose of again attempting to carry out transatlantic communication on a commercial basis, and on October 17, 1907, a limited service for press messages was commenced between Great Britain and America, but difficulty was experienced with the land companies. On February 3 this service was extended to ordinary messages between London and Montreal, the transatlantic rates proper being 2½d. a word for press and 5d. for ordinary messages. Although the stations at Clifden and Glace Bay were not yet complete, communication across the Atlantic had never been interrupted for more than a few hours since they were opened for commercial work on October 17 last. In about four months, when the latest apparatus was installed, they should be able to deal with at least 20,000 words a day. A problem of great importance which had lately occupied the attention of inventors was that of giving direction to the electric waves sent out from a transmitting station, and as the result of experiments recently made, messages could now be sent over considerable distances in the desired directions, while they traveled over only a comparatively short distance in other directions. The question of the speed of working wireless telegraphy had often been discussed, but very seldom fairly treated.

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On ships using wireless telegraphy the speed of working was approximately fifteen words per minute. This, however, was dependent more upon the ability of the operator than upon anything else, as a speed of thirty words per minute had often been attained with the ordinary ship apparatus. By means of special apparatus and automatic senders he was able to demonstrate before the Royal Institution in London that a speed of about one hundred words per minute was possible, and he believed a similar speed had been attained between wireless stations operated by the post office. At stations doing transatlantic work no attempt had yet been made to work at high speed, as other more difficult problems claimed attention. At these stations, however, a speed of twenty words per minute had already been obtained, and he saw no reason why, with suitable devices, this should not be greatly exceeded.

As to the commercial applications of wireless telegraphy, taking the order in which the art had developed, he should say—(1) communication between ships and the shore and between ship and ship, (2) communication between islands and outlying places, and as a substitute for or aid to ordinary wire or cable telegraphy, (3) communication with distant countries, such as America and the colonies. The application of wireless telegraphy as an aid to navigation and as a means for communicating with ships at sea had progressed at a rapid pace. The first British ship to be permanently fitted with wireless telegraphy for commercial purposes was the "Lake Champlain" in the Elder-Dempster fleet. Now, one hundred and sixteen liners belonging to England, Italy, France, Germany, Holland, Belgium, the United States and Austria were fitted with Marconi apparatus, and there were over fifty land stations with which these vessels can communicate. During 1907 these commercial messages aggregated 1,868,500 words. The operation of the long-distance stations at Poldhu and Glace Bay made it possible at all times to transmit messages to ships, whatever their position, between Europe and North America; and to the Cunard Steamship Company belonged the credit of having greatly encouraged the long-distance tests with their steamers. The utility of wireless telegraphy in the case of ships in distress had been repeatedly demonstrated, and its use in navigation for preventing accidents could hardly be over estimated, as all the ships equipped were constantly being advised of the state of the weather ahead of them, and whether fog or icebergs were likely to be encountered on the track. Nearly every warship in the world was equipped with wireless telegraphy, and those of the British navy were enabled to keep in touch with England when far out in the Atlantic, at Gibraltar and in the Mediterranean. Experiments were being carried out with an apparatus which would enable a ship accurately to locate the bearing and position of a land station or other ship, and he had confidence in their success. With regard to communication between islands, nearly all the Italian islands in the Mediterranean were in communication with each other and with the mainland, and wireless telegraphy was also used as a branch of the Italian telegraphic system for ordinary commercial purposes across the Adriatic. At Coltano, near Pisa, there was approaching completion a large wireless station, which would be used by the Italian government for communicating with many distant points, more particularly with the Italian colonies in East Africa, with Great Britain, with the American continents and eventually, he hoped, with the East. The British post office had used the wireless stations for communication between Cornwall and the Scilly Islands, and between the Channel Islands on the not infrequent occasions of the breaking down of the cables. It was evident, however, that in a country such as England, possessing such a well-nigh perfect organization as the post office telegraphs, which were, moreover, the jealously-guarded monopoly of the postmaster-general, the opportunities for wireless telegraphy to prove its utility for overland work were not numerous. In the colonies and in undeveloped countries the opportunities were, however, considerable. Thus, numerous stations had been installed in China, and stations were in operation in Siberia, India and East Africa. Numerous stations had been erected in South and North America, and the Canadian government possessed a chain of about twenty stations on the shores and Gulf of St. Lawrence, which enabled communication to be maintained between Quebec and some of the remotest parts of Labrador and Newfoundland. The Hawaiian Islands in the Pacific were also in wireless communication with each other, and he had reason to believe that the Imperial government was contemplating the further utilization of the system in the West Indian Islands and on the west coast of Africa.

With reference to transatlantic communication, he had every confidence that it would furnish a more economical means for the transmission of telegrams than the present cable service. However great might be the importance of wireless telegraphy to ships and shipping, he believed it was destined to be of even greater importance to the world when fully applied over such great distances as those which divided Great Britain from her colonies and from America. As to whether wireless telegraphy across the Atlantic would be practical enough to displace the cables, it was evident that long-distance practicability was no longer in doubt. Although the transatlantic stations had been worked for only a few hours daily, 88,374 words of press and commercial messages were transmitted across the ocean up to January 31 last, since when the service had been extended. Whether the new telegraphy would or would not injure or displace the cables was still a matter of speculation, but it depended a great deal on what the cables could do in the way of cheaper

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rates. Those concerned in the development of wireless telegraphy were not in business, as some appeared to imagine, for the purpose of injuring the cables. They were endeavoring at present to demonstrate that the new methods were not only valuable for shipping, but it should also be regarded as a newer and cheaper means of communicating with far distant countries. Whatever might be the views as to its shortcomings or defects, wireless telegraphy across the Atlantic had come to stay, and would not only stay, but continue to advance. Cable telegraphy across the Atlantic had been subjected, at the commencement, to a series of discouraging failures and disappointments. But whatever its difficulties, it enjoyed one advantage over wireless telegraphy—that it was free from the hostility of vested interests representing over £60,000,000 now invested in cables, which, rightly or wrongly, consider long-distance wireless telegraphy as menacing their interests. The history of transatlantic wireless telegraphy had so far followed very much on the lines of submarine cable Atlantic telegraphy. In seven years the useful range of wireless telegraphy had increased from 200 miles to 2,500 miles. In view of this fact, he would be a bold prophet who would venture to affirm what might not be done in seven years more. It was true that the wireless telegraph could not at present give a service as good or as rapid between London and New York as that supplied by the cables, but if the wireless had to compete with only one cable he was convinced that interruptions to the cable would prove to be much more serious and frequent. True, mistakes did sometimes occur in wireless messages, but these had been proved to be mistakes which had occurred in the land transmission.

There existed at the present among a large section of the public considerable misconception as to the feasibility of tapping or intercepting wireless messages. Many persons asked what was the use of sending messages by wireless if anybody could pick them up. That was exactly what they could not do. In the case of ordinary land telegraphy, anyone who knew the Morse code could, within hearing distance of the instruments, read off the messages sent and received; but in the case of wireless telegraphy, as at present worked, this was impossible, excepting by erecting a station at the cost of several thousand pounds, and in endeavoring to get in tune with wave lengths of the messages which were desired to be tapped. In any case, the safety-guard of using a code or cipher was available.

Mr. Marconi concluded with a reference to Germany's action in calling the Wireless Telegraph Conference, and he expressed disagreement with several of the regulations made by the conference of 1906. He sincerely hoped that Great Britain, like America, would postpone the ratification of this convention, which, in his opinion, would remove the benefits of free competition between the various systems, reducing the best to the level of the least advanced, until at least the business of wireless telegraphy had demonstrated more fully its possibilities. Others besides himself were carrying out valuable researches in the field of wireless telegraphy and wireless telephony, and he sincerely hoped their efforts in the development of a difficult branch of science might meet with success proportionate to their labors. He had every confidence that wireless telegraphy over enormous distances, and possibly round the world, would become an accomplished fact in time, and that not a very long time.

Representative Canadian Telegraphers.

PHILIP F. CANNIFF.

Philip F. Canniff, manager of the Great North Western Telegraph Company, at Belleville, Ont., enjoys the unique distinction of passing his entire telegraphic business career in the town in which he was born, May 23, 1867. When just eighteen

P. F. CANNIFF.
Manager Great North Western Telegraph Company, Belleville, Ont.

years of age, to be exact, on May 26, 1885, he entered the local office, in which he has since been attached, as a messenger. Learning telegraphy, at which he soon became expert, he was made an operator, subsequently advancing to the position of chief operator, and from that to the post of manager. Mr. Canniff is a painstaking official, is well informed, and has reached his present place because of merit.

Another fine of $100 and costs was assessed on February 28, at Gadsden, Ala., against the Western Union Telegraph Company for doing business without a license. This is the second fine imposed by the city authorities against the Western Union for violation of the city license tax ordinance in the last ten days. The resistance of the company to the payment of the license tax of $225, imposed by the city, grows out of the opinion of the company that the amount is excessive and unreasonable, in view of the amount of business done.

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Important Subjects Treated in Back Numbers.

TELEGRAPH AGE has published the best articles on telegraphic subjects that have ever appeared in print. Herewith are enumerated a few of the most important subjects treated, together with the date of the papers containing the same. Copies of these back numbers may be had at twenty-five cents apiece upon application. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Adjustment of Relays and Sounders .....Oct. 1, 1902
Alternating Current Transformer for Quadruplex, W. H. Jones .....Mch. 1-16, 1904
American Cable Across the Pacific .....July 16, 1903
Alaskan Telegraphs .....Jan. 1-16, Feb. 1, 1905
Atmosphere and Earth Electrical Conditions, E. C. Walker, Dec. 16, 1904
Barclay Combination Quadruplex Rheostat .....July 1, 1903
Barclay's Direct Repeating Relay for Multiplex Circuits, July 16, 1902
Barclay Printing Telegraph System, W. H. Jones.....May 16, 1905
Barclay's Repeating Relay, Main Line Relay and Box Relay, Jan. 1, 1903
Barclay Typewriting Telegraph System .....Jan. 16, 1904
British Patent Office Rules .....Apl. 16, 1905
British System of Timing Messages .....Dec. 1, 1902
Buckingham Long Distance Page Printing Telegraph....Sept. 1, 1902
Burry Page Printing Telegraph .....Apl. 1, 1903
Cable Station in Mid-Pacific, Our, Dr. Martin Crook.....Feb. 16, 1905
Central Telegraph Office, London.....Oct. 16, 1904; May 1, 1905
C. K. Jones' Automatic Telegraph Circuit Protector and Signaling Machine .....June 16, 1903
Collins Overland Telegraph .....May 16, 1903
Composite Teleg. and Telep. on Canadian Pacific Ry.....Mch. 1, 1904
Composite Telephone Lines .....Mch. 1, 1905
Crehore-Squire Automatic Telegraph System.....May 16, 1902
Definitions of Electrical Terms, Mch. 16, Apl. 1-16, June 1, July 1-16, 1904
Delany's, P. B., Automatic Telegraph System.....Mch. 16, 1903
Delany's, P. B., New System of Rapid Telegraphy.....Apl. 16, 1904
Direct Polar Relay Repeater of the Postal Telegraph-Cable Company .....Oct. 16, 1903
Earth Currents .....May 1, 1903
Engraving of Clarence H. Mackay .....Nov. 16, 1902
Engraving of Col. Robert C. Clowry .....Apl. 16, 1902
Engraving of the Late John W. Mackay .....Aug. 1, 1902
Field's, S. D., Quadruplex .....May 1-16, 1904
Flow of Electricity in the Earth .....Dec. 16, 1903
Ghegan's Automatic Repeater .....June 1, Dec. 1, 1903
Ghegan's, J. J., Multiplex System .....Aug. 1, 1904
Gray Submarine Signaling Apparatus .....Jan. 1, 1904
Hand vs. Machine Telegraphy .....Sept. 16, 1902
Improvements of Roberson Quadruplex .....Feb. 1, 1903
K. R. Law as Applied to Quadruplex Circuits.....Jan. 1, 1904
Life of Storage Batteries .....July 1, 1903
Low Resistance Relays...Oct. 1-16, Nov. 1, Dec. 16, 1902, Jan. 1, 1903
Midway Islands Cable Station .....July 1, 1904
Passing of the Quadruplex .....Aug. 1, 1903
Phillips' System of High Speed Telegraphy, J. W. Larish, Nov. 1, 1904
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Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26, 1908.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Railway Signal Association will meet in 1908 at a date and place to be named later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., in 1908, at a date to be named later.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers' Association meets at Fort Worth, Tex., on June 18, 1908.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

The influx of new men in the telegraph service has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is $1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

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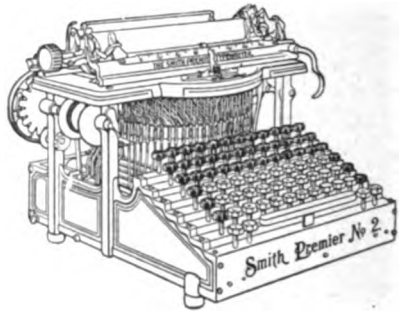

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NEW YORK, MARCH 16, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The Coercion of Telegraph Interests.

It was a sorry spectacle that the representatives of the Commercial Telegraphers' Union made on February 28, when they appeared before the Senate Committee of Interstate Commerce at Washington, at a hearing held in behalf of the bill, having for its ostensible object the regulation of the telegraphs, lately introduced in Congress through the efforts of that organization of telegraphers. Vindictiveness of purpose directed against the telegraph companies was so clearly manifest in the proceedings, as it was also no less expressed in the bill itself, although in that instance the ulterior motive was more carefully guarded against by prudently conforming to established forms of outward expression, as to approach the ludicrous, yet none the less to be condemned for its virulence.

It has often been the complaint that a certain class of telegraph operators would not hurry their work any faster than could be avoided, the impelling reason for such inertia being the same as that so often observed in the operations of the ordinary laborer. The statement made to the committee by James T. McDermott, a telegraph operator, a member of the telegraphic union as well as a member of Congress, hailing from Chicago, who was put forward as a speaker to explain more fully the situation of the complaining operators, was not only lacking in dignity and refinement of speech, but inadvertently revealed the "true inwardness" of the disgruntled telegraphers and the animus that largely directs their present action. In referring to "young operators," inferentially honest, he said that while "it does not make any difference how many they send," they "are sometimes suckers enough to send fifty messages an hour." When questioned by Senator McLaurin, a member of the committee, "Why would the new men send more than the older telegraphers?" the significant reply was made, "Because of ambition. He expects to rise, to get up to the good operators, trying all the while to get up to a higher salary, and that is the reason they will work in that way; and it has been agreeable to the Western Union and Postal telegraph companies to allow them to do that."

In other words, as unconsciously and blunderingly expressed, the influence of the union is and has been exerted to limit and obstruct the volume of work performed by operators and thereby check telegraph business, of which it has the exquisite effrontery to declare the companies themselves are guilty. The baleful effects of this telegraphers' union is also shown in the fact that it seeks to place all operators on a common level, to discourage ambition and to reduce the expert to the plane of the least capable. Apparently the ethics of this amazingly constituted union would reward the display of ambition and honorable motive on the part of the individual by hurling at him the opprobrious epithet of "sucker!"

The pity of it! It is humiliating to reflect that any body of men calling themselves telegraphers, a word and an occupation that should stand for something high and noble in name and purpose, should lend themselves to such a movement as that here referred to. It should be distinctly understood, however, and to their honor, that the great loyal body of telegraphers in the employ of the telegraph companies of this country, have no sympathy with this agitation directed mainly by the striking element who find themselves out of employment as a result of their own folly, in an attempt to coerce telegraph interests through national and state legislation.

In the further discussion of the bill, its numerous incongruities became apparent. It transpired that in the third section, which fairly bristles with provisions determining various compulsory measures enjoined upon the telegraph, with corresponding penalties attached, that the time of filing a message be transmitted with the message itself. Failure in the performance of

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this duty, it was set forth, should be of such criminal consequence as should warrant the imprisonment of the offender for the modest term of three years, or the imposition of a fine, or both. A grim and fierce purpose was no doubt wrapped up in this merciless phraseology. One feature, at least, of the appalling enormities of the hitherto lax methods governing the telegraph companies, was to be sternly rebuked! Justice was aimed at, and it was well to cause terror to seize upon an unsuspecting management.

When it was pointed out by Senator Aldrich, of the committee, that retribution in such a case would fall, not on the president of a telegraph company, whose ignominious incarceration had evidently been determined upon, but on the operator, who would be adjudged the guilty felon, Mr. McDermott could only gasp. "The bill is possibly too drastic." Senator Tillman, also of the committee, who appeared to regard the proceedings from a facetious point of view, dryly remarked that the bill as drawn "hits the other party," while Senator Elkins, the chairman, exclaimed commiseratingly: "You do not want to get the operators in jail!"

In view of the farcical character of this telegraph bill and of the causes that led to its presentation in Congress, and of its champions, Representative Cary, of Milwaukee, who introduced it on January 23, and of Representative McDermott who has appeared for it, both of the latter being telegraphers closely affiliated with the union and imbued with its antagonism of spirit to employing interests in the telegraph service, the measure should be buried in oblivion. It probably will be, and the fear of Mr. Cary that such will be its finality is plainly hinted at in a circular letter which that honorable member of the House has sent out in the most extraordinary manner, carefully concealed in packages of seeds, which he is distributing among his constituents, and in which he goes to the length of attacking the conduct of brother Congressmen for alleged gross inattention to duty (?), smartly defining his own position and acumen in the concluding paragraph in his remarkable communication, as follows: "However, I learned a few things myself while alderman and sheriff, and these fellows have found out that they cannot put me up a tree."

From such an atmosphere as matters here referred to have created in Washington, emanate much of the stuff that is being distributed throughout the country in unfair, illogical and false criticism of the telegraph. It finds inspiration in sources generally ignorantly or maliciously hostile to the telegraph, much of which is traced to the vaporings of the Commercial Telegraphers' Union, and which numerous editors, as we remarked in the March 1 issue of Telegraph Age, use in their columns either thoughtlessly or because imbued with the current desire to make a fling at corporate interests without any too clear a conception of the issues at stake.

If in the "course of human events" it should finally appear that public interests would be better conserved by causing the telegraph to be placed under government supervision, it may be said that the demands of justice will not be ignored, that action in the matter may be relied upon to proceed with fairness and right, guided by the law of equity, of common sense and of impartial judgment.

The Irony of It All.

We supposed that Telegraph Age had made its utterances tolerably clear regarding the telegraphers' strike last summer and fall, and that the warning of evil consequences sure to follow, that it held out to telegraphers concerned therein, both before and during that disastrous occurrence, would admit of no misunderstanding. At any rate, the paper was roundly berated at that time by telegraphers actually engaged in the movement, and it would appear that if any offence was committed by this journal it was one of commission and not of omission. Now that the hurricane has spent itself and a calm has succeeded, following out a common law of nature, certain of the wrecks that strew the beach of the ocean of industrial labor by the receding storm wave, in the shape of telegraphers out of employment, moan out the plaint that if Telegraph Age in the exercise of its ommiscience, had informed them, as it should have done, that such dire disaster as has overtaken them, awaited their precipitous action, they would not have vacated their positions.

The irony of the situation cuts deep. All we can say is that if any individual failed to understand what we predicted would be the outcome of the strike it is bad grace to charge Telegraph Age with ambiguity. Some obtuse minds need a bludgeon to arouse them into a state of sensibility.

The publisher of Telegraph Age urges upon subscribers to this journal the desirability of having the paper sent to their home address rather than to their place of business. The reason is obvious. If it goes to your home it reaches you without danger of obstruction or abstraction by your office associates who are sometimes prone to borrow your copy to your discomfiture and their edification, but at your expense. This naturally is a source of irritation and of course you don't like it. If a man wants Telegraph Age he should pay for it, and the individual who is paying for his copy should be guaranteed in his rights.

As we regard our subscribers as our friends, and believe we are supplying them with a telegraph paper the like of which does not elsewhere exist, we dislike to see them disappointed, and wish to protect them in their prerogative so far as we are able. We believe that a good many disappointments of non-receipt of the paper might be averted if our suggestion of sending it in all cases to the homes of its subscribers were adopted. Changes of address will be made as often as desired.

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Dividends and Wages.

In a time of industrial depression the directors of a great corporation have no other problem so hard to solve as that of satisfying the conflicting claims of investors and wage earners. When earnings decline owing to a falling off in the volume of sales or of traffic, the question is presented to the managers of a corporation, shall dividends be reduced or wages? In some cases, says the Wall Street Journal, the answer must be a reduction in dividends; in other cases a redution in wages; in many cases a reduction in both dividends and wages.

The managers of any well ordered corporation would much prefer not to disturb either dividends or wages. They are as solicitous to maintain the interests of their laborers as they are of maintaining the interests of the capitalists who have invested in their stocks.

No great employer of labor likes to be compelled to lay off men from any cause, much less that of depression in business, nor does he like to reduce the rate of wages. He is solicitous to maintain the integrity and esprit de corps of his whole system of workmen. Nothing makes for profit more, things being equal, than a staff of well paid, contented men.

Nevertheless, the interest of the investors in the property must be looked after with just as much solicitude and faithfulness. They have put their capital into it, they have trusted in its earning power, they are as much entitled to their wages, which is the interest upon their investment, as those who put their labor into the property. These are truisms, but it is well to restate them once in a while, especially at a time like this when there is likely to be, and indeed is, a conflict between these two interests. Extreme selfishness on the part either of the stockholder or the wage earner will result in the permanent injury of both.

If the stockholder insists in a time of depression upon a return upon his investment equal to the profit of prosperity and regardless of the welfare of labor, then he is pursuing a heartless and in the end a short-sighted policy. If, on the other hand, labor insists upon a high rate of wages at a time of industrial depression regardless of the rights and interests of the stockholder, then he will in the end suffer far more than he would if he accepted a reduction in his wages. He will suffer more because capital will be reluctant to make a new investment in a corporation which will sacrifice the interest of investors ruthlessly. Anything that approaches confiscation either of the fruits of capital or of the fruits of labor is sure to be calamitous.

A decision which has just been rendered in Canada by a board of investigation in the case concerning the demands of the telegraphers of the Grand Trunk Railway for higher wages involves the very principles which have here been laid down. In this case one member of the board represented labor, another represented capital, and the third was a recognized authority on economic subjects.

The same board had recently rendered a decision in favor of an increase in wages for the telegraphers of the Canadian Pacific Railroad, and yet they rendered a decision against granting the Grand Trunk telegraphers the similar rate of wages. This would seem on its face like cruel inconsistency. But when the reasons for the decision are given it appears eminently fair. The board made no concealment of the fact that the cost of living had increased and under different conditions the telegraphers would be fairly entitled to the higher wages which they demanded; but the board showed that the Grand Trunk had been constructed through a territory which for a long time had yielded insufficient revenue to pay expenses and that the capitalists who had invested in it had therefore not been suitably rewarded. The Canadian Pacific, on the other hand, had been favored by large land grants and other advantageous conditions. The board, therefore, thought it was not fair that such dividends upon the preferred stock of the Grand Trunk as are being paid should be further reduced by an increase of wages, especially as no dividends were paid on the common stock, and it summed up its opinion in the following words:

> The deterring of the investment of capital in railway undertakings would certainly not be a benefit to the community at large, and if the property of lenders is to be practically confiscated between the demand of the public on the one side and the demand of the employees on the other, it must lead to a general reduction in wages or a shrinkage in the number of employees, with a much greater ultimate loss to labor.

This would seem to be a fair principle to start from in deciding the similar disputes in this country. But it should be firmly kept in mind that any injustice either to capital or to labor in any decision will react upon the side benefited by such decision and what is worst of all, will react upon the country as a whole. The spirit of fair play must prevail.

Telegraphic Communication Across the Sahara.

A plan has been submitted to the French government for extending the telegraph lines in Algeria from Beni-Abbes to Adrar, a military post about 745 miles from the Mediterranean coast. The wires would then be laid in the direction of the Niger to Bourren, a distance of about 869 miles, of which 621 miles would be in Algerian territory and the remainder in the Soudan. By making branch lines from Bourren to Timbuktu and Say, the whole of the Soudan, Dahomey and the Ivory Coast would be connected with Algiers. The cost of the undertaking will be $500,000, and the work is to be completed in about eighteen months.

The underground telegraph cable from Newcastle to Durham, England, will be finished in about four months. During the next financial year it will be extended to Leeds, via Stockton.

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Experimental Pole Treatment.

BY WALTER R. WHEATON.

(In the Journal of the Worcester Polytechnic Institute)

At the present time the United States is facing the same problem which the European countries were called upon to face years ago—the constant diminution in the supply of timber. The two greatest consumers of our timber resources, the railroads and the power and telephone and telegraph companies using poles for transmission lines, are wondering where their future timber supply is to come from. The decrease in the supply means increase in the cost of the product, and with a constant increase in the demand the prices are constantly rising. On the Pacific Coast in the last two years the cost of a forty-foot pole has almost doubled.

There are three solutions to the problem, or, at least, three ways whereby the evil day may be put off; (1) by using some substitute for the wooden poles and ties now in use; (2) by treating all poles and ties used in the future with some preservative which will add to the life of the wood, and consequently increase the available supply; and (3) by the use of inferior woods, whose use is made possible only by the use of a preservative. The first method has been and is being tried. Steel and concrete have been used both here and abroad, but with little success. Poles of reinforced concrete are in use to some extent abroad and steel and iron poles are being used here. The Edison Electric Company, of Los Angeles, Cal., is using two types of steel poles. On its main line from the power house in the Kern River country to the distribution station in Los Angeles, a distance of 167 miles, and over which line it is transmitting 40,000 horsepower, steel towers set on a concrete base are in use. The wires are carried on porcelain insulators two feet high, set in iron pins. This is probably the finest transmission line in the country.

The Forest Service of the Department of Agriculture is doing all in its power to diminish the demand and to increase the supply of timber as much as possible by the creation of national forests, by forest planting, by inducing the use of forestry methods on lands to be lumbered, and by co-operating with the various consumers in an endeavor to find some economical method of preserving the product against decay. The pole presents a different problem from the railroad tie. The tie is in contact with the ground and subject to decay for its whole length, and consequently the whole tie is treated. A pole usually rots from two feet below the ground to one foot above. The expense of treating a thirty-five-foot to forty-foot line for its whole length to insure it against decay for only three feet of its length would be too great. Consequently a pole is treated only from the butt up to one foot above the ground line, or for seven or eight feet of its length. Owing to the unsymmetrical formation of a pole it is almost impossible to use pressure on the butt only. A pressure apparatus was constructed by the Forest Service for use in the experiments now being carried on in Southern California, and although it was found possible to get a pressure of sixty pounds to the square inch before a leak was discovered, the cost of the treatment was found to be too great in view of the penetration which could be obtained without pressure.

There have been three methods used by the Forest Service in its experimental treatment of poles—the brush method, the butt-plate method, and the open-tank method. The former consists in painting the preservative compound on with a brush. The oil is usually applied hot. This method gives the pole a thin coating of oil, the penetration being not more than an eighth of an inch, and usually less. The oil usually used in treatments of this kid is a carbolineum made from the distillation of naphthalene. It has a specific gravity of about 1.2, and is a very heavy, high boiling oil. The objections to the use of this method are as follows: The pentration is very slight, which necessitates very careful handling of the pole after treatment; if a cant hook is jammed into the treated section of the pole, the point of the hook will penetrate below the oil and thus leave an opening for the fungus to take root. All of the checks must be filled, for if the checks are not filled, or if the pole checks after setting, the effect of the treatment is lost, since there is an available foothold for the rot-producing fungi.

The butt-plate method was designed for forcing the oil into the pole under pressure. A plate (a little less in diameter than the diameter of the pole) having a raised knife edge was placed against the butt of the pole so that the knife edge entered the wood and formed a chamber for the oil between the butt of the pole and the face of the plate. Three dogs were driven into the side of the pole and held the plate firmly against the butt. The oil was pumped through a one-inch pipe screwed into the back of the plate. When the pressure was applied it was found that the oil squirted out through the season checks in the wood, making it impossible to force the oil into the pole. Another objection to this is the fact that there is an outer layer of wood left with no oil in it and it is very esential that this outer layer be penetrated. This method was abandoned by the Forest Service as not giving the desired results.

The process used with the most success by the forest service is what is known as the open-tank process. This is an application of the old Seeley process. The wood is given a bath of hot oil followed by a bath of cold oil. The poles are submerged in hot creosote oil for a depth of one foot above the ground line, and are allowed to remain in the hot oil for from five to eight hours. They are then either placed in another tank containing cold oil or are allowed to remain in the same oil as it cools. When the timber is placed in the hot oil, the moisture remaining in the wood

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is evaporated and the air in the wood cells is expanded. When the poles are changed from the hot to the cold oil or the oil is allowed to cool, the difference in the temperature induces a vacuum which causes the oil to penetrate the wood. The poles should always be thoroughly seasoned before treatment.

Patent Office Scandal.

On Thursday, February 27, an indictment was filed in the Supreme Court of the District of Columbia, against Examiner Ned. W. Barton, of the U. S. Patent Office, John A. Heany, of York, Pa., and the patent attorney of the latter, Henry E. Everding, of Philadelphia, in which it is charged that they "unlawfully and wilfully and with intent to steal and destroy the same, did take and carry away from the said patent office" certain specifications and an amendment thereto, and a letter relating thereto, the date of the offence being September 2, 1907. The specifications were filed with, and formed part of, an application, No. 241,782, filed January 19, 1905; the amendment was filed on July 27, 1907; the letter, which was addressed to John A. Heany and signed by W. A. Cowles, acting examiner of the patent office, and bore the stamp of Commissioner F. I. Allen, was dated March 28, 1905. Those charged with the crime were arrested and held on $10,000 bail, which was furnished.

The patent involved is apparently one bearing date of issue of December 3, 1907, and relating to tungsten-filaments and electrodes for incandescent lamps. According to the newspaper accounts, applications from a large number of electrical concerns have been in interference with the Heany application upon which the patent is based, and the changes alleged were made to secure a patent that would be superior to any granted on these applications. The evidence presented to the Secretary of the Interior is stated to have been obtained by detectives in the employ of one of the large electrical manufacturing companies.

In a statement relating to the case, Patent Commissioner E. B. Moore said that early in February evidence was laid before the Secretary of the Interior, tending to show that fraudulent acts had been committed in the prosecution and procurement of a patent. The secretary at once brought the matter to the attention of the Commissioner of Patents, who immediately appointed a committee of investigation. This committee found in substance that by the connivance of an employee of the Patent Office, matter that was not in the application for a certain patent at date of filing was unlawfully introduced subsequently during its prosecution, thereby laying a foundation for claims to an invention not disclosed in the application when it was filed. The effect of such an act is to establish a false date of invention much earlier than the true date and thus enable the patentee to dominate and control all inventions falling within the scope of the claims of his patent that were made after the filing date of the application for that patent, even though in fact they may have been made earlier than the invention covered by his claims.

The specific charge, Commissioner Moore said, is that of destroying public records. It is alleged that Barton, by reason of his position, had access to office records, and was enabled, at a very recent date, to substitute for papers filed more than two years previously, certain other papers and give them the same date as if they had been filed originally. The invention described in the substitute papers is thought to be very valuable, and a great advantage would attend it if a date of invention sufficiently early to antedate the prior inventions of others could be secured. To be successful in this plan it was necessary to destroy original records of the office, and file substitutes therefor, and by changing the dates of receiving stamps make it appear that such substitute papers were, in fact, actually filed upon the fictitious dates stamped on the papers.

Commissioner Moore added that notwithstanding the vast moneyed interests involved in patents and the consequent many opportunities for corruption arising therefrom and from the necessity of relying upon the integrity of each individual examiner, owing to the technical and judicial character of the work of the patent office, to examiner has ever been shown false hitherto to the trust imposed upon him in all the one hundred and eighteen years of existence of the United States patent system.—Electrical World.

Longitude by Telegraph.

It has lately been thought necessary by the Hydrographic Office of the English Admiralty to determine the longitude of the Island of Ascension by the telegraphic method, and this is now being done under the auspices of the hydrographer acting in concert with the astronomer royal. Officers of H. M. S. Mutine are at Ascension making observations to find local time, or, in other words, the error of their chronometer on the time of the place, and the difference between Greenwich time and that shown by the chronometer is being found by telegraphy, the Eastern Telegraph Company giving the use of their cable when required. It is necessary for this delicate work to avoid all possible loss of time in transmission, even so small a fraction of a second as might be caused by the interposition of a relay, and the company are sending signals through more than four thousand miles of unbroken cable from Porthcurnow, in Cornwall, to Ascension. The standard clock of the Greenwich Observatory is made to record the beats of its seconds by telegraphic connection on the siphon recorder at Porthcurnow, and with these beats the signals sent from Ascension are compared.

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Kelvin and Submarine Telegraphy.

Prof. W. E. Ayrton, who was a student under Sir William Thomson, at Glasgow, contributes a lengthy and highly appreciative letter to the engineering supplement of the London Times, with the title "Kelvin in the Sixties." From this we print below the portion which treats more particularly with Kelvin's connection with the development of the submarine telegraph:

During the sixties the world was very much interested in the possibilities of an Atlantic cable. In 1857 the cable had broken while being laid; the 1858 one had failed after one short month of existence; the 1865 cable snapped after 1,186 miles had been laid, and, although nine days were spent in trying to pick it up, and, although it was grappled many times, the rope broke; and this cable, like its predecessors, had to be abandoned. A few yards of this 1865 cable that had been picked up lay on the floor of the Glasgow laboratory and was often pointed to by Thomson as being what had given them heart and kept off despair. Then a prize of over three-quarters of a million sterling was offered to the Telegraph Construction and Maintenance Company if they could complete the 1865 cable and lay an 1866 one. And they won it.

While it was remaining doubtful whether the two sides of the Atlantic would ever be coupled electrically, Thomson's secretary used not unfrequently to be sent to the Glasgow railway station a few minutes before the mail train started with this urgent message from Thomson: "I have gone to White's to hurry on an instrument. The London mail train must on no account start to-night, until I come." And such was the national importance of the problem, and such the honor in which Thomson was held, that the stationmaster obeyed.

Many have used Thomson's reflecting galvanometer and have regarded it merely as an extremely sensitive instrument without knowing how it came into existence. It was devised by Thomson to enable him to utilize his mathematical solution of signaling through a long submarine cable, and was regarded of such national importance that a private Act of Parliament was sanctioned by the Privy Council to extend the normal life of fourteen years for the patent of this cable "speaking instrument," as it was originally called. The invention of this instrument marks the theoretical solution of a most important problem, which solution Thomson found great difficulty in getting the electricians of that day to accept.

As early as 1855—before any long submarine cable had been constructed—Thomson published in the Proceedings of the Royal Society the theory of the propagation of signals through a cable based on a correspondence which he had had with the late Sir Gabriel Stokes, and he showed that the book "Fourier de la Chaleur"—that "mathematical poem," as he used to call it—contained, in Fourier's mathematical equations of the flow of heat, the entire mathematical solution of the propagation of electric waves through a cable. From "Fourier's series" he deduced that, whereas on a short overhead telegraph line the signal reaches its full strength at the distant end practically as soon as the signaler at the near end of the line begins to send it, with a submarine cable it is retarded, spreads out, and blurs the next signal. There is a past history effect as in politics and in many natural phenomena. The passing of an Act of Parliament cannot suddenly change a people; indeed, it is well known that the actual effect of an Act of Parliament promoted by well-wishers is often gradually found to be most harmful, and has to be repealed or curbed in its action.

Herbert Spencer in his "Sociology" strongly advocated legislators to study the science of politics. Thomson would perhaps have said "Study Fourier's mathematical poem."

If it were attempted to send a series of electrical signals through an Atlantic cable with the same apparatus and at the same speed as messages are sent between London and Brighton, the signaler at the far end would not have the slightest knowledge that the signaler at this end was trying to send a message, whatever were the strength of the current sent into the cable. To work a long submarine cable, either time must be allowed for each signal to grow at the distant end, or, as this would make the sending of the message very slow, the receiving instrument and the signaler receiving the message must, like a clever doctor diagnosing a disease, be able to interpret mere indications. Sending the letter "e," for example, produces at the other end of a long cable a totally different result, depending on what has preceded it. In no case, at a speed of, say, thirty words a minute with a 3,000-mile cable, will it be more than a suggestion, even at the beginning of a word; but in the syllable "toe" the "e" is as indistinct as the hurriedly written scrawl that you are very glad to get some one else to read for you.

Thomson wanted a receiving instrument which, unlike the ordinary telegraph instruments used in post offices and railway stations, could render the interpretation of such suggestions possible in the hands of an expert signaler, and he devised the mirror galvanometer speaking instrument to obtain this result.

Another most important fact that his theoretical investigation brought out was that no increase of battery power could counteract the retardation in the signals produced by any impurity existing in the copper conductor of a cable, and hence that every yard of copper wire used in the thousands of miles of a long cable must be electrically tested before being used.

But all this appeared to the electricians as arising from the ignorance of an inexperienced young man who had never erected a mile of telegraph line in his life, and would not have been given a job in any telegraph office. And so when signals through the 1858 Atlantic cable became weak, and

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a message from the President to our Queen took thirty hours in transmission, although containing only one hundred and fifty words and which would need only three or four minutes to transmit through any one of the good Atlantic cables of to-day, the only remedy of those who looked down on the theories of the young Glasgow professor was to use Whitehouse's "thunder pump," a magneto-electric machine which produced a sudden large e. m. f. when the armature of the permanent magnet was jerked off the poles of the magnet. But these shocks only sent sparks through the gutta-percha insulating coating and hurried the poor cable to its doom, so that even the three words per minute which would have been the utmost limit of speed possible had this cable been entirely uninjured, were replaced by absolute silence.

But Thomson energetically struggled on and pursuing (as he told me afterward) a "Parnell-Biggar policy" at the board meetings of the Atlantic Cable Company, obstructed all business until the directors promised to have all the copper wire tested for resistance before being made into cable; and thanks to Thomson for his theory of signaling, to that engineer of energy and surprising resource, even when quite a lad, Sir Charles Bright, to Captain Anderson, of the Great Eastern, and to all those who have followed in the history of submarine cable development the London Stock Exchange is by cable today within thirty seconds of Wall Street.

Thomson's work in connection with submarine telegraphy has been epoch-making. But thirty-three years ago it was associated with what I felt was a national loss. I give in an extract from a long letter which he wrote to me in Japan, December, 1874: "My dear Ayrton—You will be very sorry to learn of the terrible loss which has befallen us in the loss of La Plata, cable ship, with my nephew, David King, on board. * * *" David King and I had worked together for Thomson. I had seen them much in company with one another. In appearance, independence of thought, and in many ways there was great resemblance between them, so that I used to hope that a corner of the mantle of William Thomson might rest on David King."

Thomson has been called an engineer. In creative power, yes—a great engineer. But not in the '40s, nay, even in the '60s, could a university student either at London, Glasgow or Cambridge learn to be what to-day is called even a college engineer. Thomson had never learned to make a working drawing, he designed in metal. We students could not help him with the T-square and drawing board as we might have done had we received the college engineering training of to-day. He thought of a new instrument, a new method of accomplishing some result flashed on him, and he sketched in his pocketbook a rough indication of what he wanted constructed; I took the idea, or what I understood of it, in my head to Messrs. White, so it was not to be wondered at that alteration after alteration was necessary before the thing that was in Thomson's mind's-eye became realized in metal.—Electrical World.

Effects of a Sleet Storm.

The blessings of this resourceful age are never fully realized until the facilities of communication fail, and then only is it that we come to an intimate realization of what life must have been in the days of our forefathers, before the inventive and practical genius of Morse, Bell, Edison, Stephenson and their successors made communication easy and annihilated time and space, writes J. H. Baker in the American Telephone Journal. To be shut in a city, with no way to get out, not a wheel turning nor a light burning, telegraph, telephone, trolley and electric light wires hanging in the streets endangering life and limb, everything held in a grip of ice, was the experience undergone by the people of Atlanta, Ga., on February 10 and 11.

The storm was as unexpected as it was severe. Sunday morning, Februarv 9, broke with a slaty sky but moderate temperature, and the weather bureau had received no warning of what was to come. Toward five o'clock Sunday afternoon, the air grew crisper and somewhat moist. A little later a mixture of sleet and snow and rain began coming down, and by eight o'clock the whole town lay still and white in a mantle of ice. A cold rain then set in which froze as fast as it fell, covering the trees and house-tops. At 10.30 P. M. nearly all the trolley cars had been forced back toward the barn, a good many not reaching there, being blocked by the ice and falling trees. By eleven o'clock electricity had been shut off from all wires, with the exception of those connected to the down-town sub-station, which kept a few lights sputtering, the immediate district being all underground. Outside of this everything was in total darkness. At midnight the wind, whipping out of the northeast, began to congeal and solidify the particles of sleet and drops of rain that hung in big clusters from the trees and wires, and all night long the icy coating gathered. At day-break the work of the elements was accomplished. They had noiselessly conquered the city, and an entire population of 150,000 people, peering through their misty windows, beheld a wonderful sight.

Ice was everywhere. Trees were grown to astonishing proportions, bending over, groaning with their added weight. Overhead wires looked like icy cables, and the sound of falling ice as the wires parted was constantly heard. At eight o'clock, the hour for most men and women to leave for their work, not a street car was running, nor trying to run. In fact (by orders of the city electrician) the current had not even been turned on, as telegraph, telephone and police service wires had fallen and become entangled with the trolley and power circuits all over the city.

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The Damping in Sending and Receiving Circuits in Wireless Telegraphy.*

BY K. E. F. SCHMIDT.

The waves emitted from a sender in wireless telegraphy suffer damping in consequence of a variety of circumstances. One important source of damping is connected with the electrical phenomena of the atmosphere. To study such matters as these it is important that the apparatus worked with, both at the transmitting and the receiving ends, should be of such a nature as to exert as little as possible of their inevitable damping action. The sending system available for the present experiments consisted of a plane harp of ten straight phosphor-bronze wires, each two millimeters diameter and twenty meters long, spaced one meter apart. When this was connected to an artificial earth the natural wave length of the system was about three hundred and six meters. The spark-gap was double, each partial gap being eight millimeters. By the aid of a Donitz wave meter and a thermo-element in series with a galvanometer the resonance curve was determined and drawn. Similar measurements were made also when the vertical harp, instead of being connected to the earth, was connected to an equivalent electrical counterpoise. This counterpoise was also a harp of wires, held insulated about five meters above the ground. Under otherwise precisely the same conditions as before, the resonance curve for the sender was again determined and drawn; with the result that the logarithmic decrement was now 0.19 where, with the directly earthed radiator, the logarithmic decrement was about unity. Using the harp radiator together with the harp counterpoise, the author proceeded to examine how varying the length of the spark-gap affected the damping. Contrary to expectation, and, in fact, contrary to the measurements by Rempp of the spark resistance in closed oscillatory circuits, he found that the damping was smaller the longer the spark-gap; so that two gaps of eight millimeters each in series was the best disposition possible with his apparatus. Rempp found a minimum of damping in his experiments, which occurred with a gap of about four millimeters to five millimeters.

The capacity of the harped radiator was about three hundred electrostatic units. When it was directly coupled to a Braun circuit containing 13,000 centimeters in Leyden, the values of the logarithmic decrement for the two resultant waves were less than half the magnitude of the logarithmic decrement for the previous arrangement. While these measurements were in progress it was noticeable that great variations existed between the logarithmic decrements measured on different days. This points to some influence exerted by the atmosphere (through ionisation of the air?), and is a variation often attaining a twenty-five per cent. difference. Moreover, marked differences in logarithmic decrement may on occasion be perceived at short intervals on the same day. For example, on June 2, 1907, at Halle, A. S. Cröllwitz, the logarithmic decrement between 11 and 11.35 o'clock was 0.164, and between 11.45 and 12.10 o'clock was 0.142. At the same times the "ratio of transmission"

$$\frac{\text{Galvanometer deflection recording received current}}{\text{Galvanometer deflection recording sending current}}$$

to a receiving station eight kilometers away was, during the first interval, 0.61, and during the second interval 0.71. During the first period the sky was cloudy and the atmosphere sultry, during the second period a violent wind was clearing the sky; corresponding to the thirteen per cent. alteration of the logarithmic decrement, and the seventeen per cent. change in the ratio of transmission.

For the accurate study of the causes of the damping in the receiver a receiving station placed at a distance of three hundred and sixty meters was used. At first a single air wire of phosphor-bronze, two millimeters diameter, with its upper end sixteen meters above the earth and its total length 18 meters was earthed through the tuning coil and barretter circuit. Later the vertical wire was connected to a horizontal wire of eighteen meters, which could be placed in positions pointing towards or away from the sending station. Finally, the movable horizontal wire alone was connected through the tuning coil and the barretter to earth. A series of measurements of the damping showed that here again the earthed antenna had decidedly greater damping than the antenna connected to an electrical counterpoise. Further, the damping was larger when the horizontal wire pointed away from the sender. Thus it seems advantageous at both sending and receiving ends to use artificial earths extending horizontally towards one another. On the other hand, if the ratios of transmission be measured with these various dispositions of the receiving antenna, then the following results are obtained:

Vertical receiving wire, earthed....ratio = 2.84
Vertical wire, with horizontal extension pointing towards sender.....ratio = 2.3
Vertical wire, with horizontal extension pointing away from the sender...ratio = 0.8
Horizontal wire, earthed and pointing towards the sender.....ratio = 0.79
Horizontal wire, earthed and pointing away from the sender.....ratio = 0.24

Thus, in spite of its considerably higher damping, the earthed systems show a large superiority as regards receiving.

It may be mentioned that the "earths" used in these experiments each consisted of two copper gauze cylinders forty centimeters high and one meter in diameter, sunk separately one meter

* Abstracted from the "Physikalische Zeitschrift," by an English contemporary.

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in the earth and surrounded by a coke packing. But another series of experiments were carried out with an "earth" consisting of iron netting of five centimeters mesh and of about five square meters area, laid directly on the earth. Now the strength of the signals received depends very greatly on the position of this earth relative to the antenna.

It is clear that when the horizontal lead to the netting is behind the vertical part of the antenna the received effect is much smaller than when it is in front. The author explains this phenomenon at length. It is sufficient to say that when the horizontal extension is against the direction of the advancing waves—that is, when it points towards the sender—then the current in the horizontal part is in practically the same phase as the current produced by the wave in the vertical part, and thus the effects conspire; while when the netting is behind the antennae there must be a large phase difference between the currents in the two parts. To corroborate this the author made a few experiments and drew the resonance curves of both parts, the vertical and the horizontal, taken separately, and thus shows that when taken together the difference of the effects may be made zero.

Army Enrollment of Military Telegraphers.

Colonel William R. Plum, of Lombard, Ill., the historian of the United States Military Telegraph Corps, in a letter of recent date addressed to Telegraph Age, contributes the following important and interesting letter regarding that portion of the corps who were enrolled members of the army and who were detailed for telegraph service, and gives their names. The injustice of Congress in persistently refusing to recognize and legalize the army standing of the remaining portion of the military telegraphers, equally with that of a few, because of a technicality of enlistment, which it was originally the purpose of the government to remedy, is rendered all the more glaring when it is considered that all who served in this branch of the army, of which they were an integral part, did so from patriotic motives, governed by intelligent and important purpose and devotion, sharing hardships, sufferings and dangers in common with the soldiers.

"From data collected for my history of the Military Telegraph Corps," writes Mr. Plum, "I have arranged the following list of telegraphers who were detailed from the army to serve as military telegraphers. Out of about one thousand two hundred members of the corps it will be noted that one hundred and fifty-eight were furloughed because they could render greater service at the key than by carrying a musket. I am inclined to believe that fully two hundred were detailed from the ranks besides one lieutenant and one captain. That is to say, one-sixth of our number was mustered into the army and then taken from original service to fill more important positions. Some of them were detailed so quickly that they never were even drilled, yet all of the two hundred, besides receiving the higher pay as telegraphers, were always carried on the regimental rolls and always enjoyed, as they should, every privilege and benefit accorded to other soldiers in the army."

Here is the list of soldiers detailed:

W. J. Armes, 76th Pa. Volunteers; M. S. Andrews, Co. I, 3d Regiment N. Y. Volunteers; William Anderson, 90th N. Y. Volunteers; W. K. Applebaugh, sergeant-major, 16th Pa. cavalry; Hudson H. Allen; Michael Askins, sergeant, Co. I, 13th Ill. infantry; James Allen, corporal, 4th Maine Battery.

Clinton S. Barrett, Co. H, 69th Pa. Volunteers; Milton H. Bassett, 13th Conn. Volunteers; F. H. Bassett, 13th Conn. Volunteers; — Beckwith; — Blish; J. W. Boyd, Battery G, Independent Pa. Artillery; Edgar H. Brown, 18th Missouri Volunteers; James N. Bentley, Co. C, 2d N. J. Cavalry; Chester A. Buck, Co. G, 2d Ohio Heavy Artillery; John Burton, Co. C, 10th Minn. Volunteers; Alonzo M. Bush, Co. F, 56th N. Y. Volunteers; O. B. Bromley, Artificer Co. H, 1st N. Y. Engineers; J. B. Berry, Co. H, 1st N. Y. Engineers; Henry H. Bishop, Co. K, 141st N. Y. Volunteers; Marsden K. Booth, Co. F, 93d Illinois Volunteers; William J. Bodle, Co. G, 10th Pa. Reserves; John H. Black, Co. D, 65th Ohio Volunteers; R. H. Brigham, Co. H, 6th N. Y. Cavalry; Thomas R. Berryhill, Co. G, 8th Mo. Volunteers; W. F. Bottoms, Co. F, 60th Ill. Volunteers; Clark Brannan, Co. A, 15th Conn. Volunteers.

Henry Cutter, 7th Independent Reg. Co. C. Cavalry; Samuel P. Camp, Co. H, 11th Ill. Cavalry; Alfred W. Carroll, 5th Md. Volunteers; Samuel Carey, Co. B., 4th Ohio Cavalry; John W. Carver, Co. G, 147th Pa. Volunteers; William H. Chaddock, 1st Ky. Battery, Light Artillery; John H. Chittenden, Co. A, 22d Wisconsin Infantry; Albert F. Childs, Co. D, 93d Ill. Volunteers; John R. Cornelison, Co. D, 52d Pa. Volunteers; James L. Crowl, sergeant, Co. C, 160th N. Y. Volunteers; Joseph W. Collins, Co. I, 93d Pa. Volunteers; Oscar F. Cheeney, 2d Co. Minn. Sharpshooters; Leverett E. Curtiss, Co. F, 3d Ill. Cavalry; John Harvey Cutter, 3d United States Infantry; A. R. Chamberlain, Co. A, 100 N. Y. Volunteers; Frank W. Davis, Co. B, 207th Pa. Volunteers; James C. Denny; Samuel Davis, Co. G, 1st Mich. Sharpshooters; William H. Dougherty, Co. H, 13th Kansas Volunteers; I. N. Drew, sergeant, Signal Corps, U. S. A.; J. H. Dwight, Co. C, Berdan's Sharpshooters; John F. Duell, Co. F, 150th N. Y. Volunteers.

William H. Eaton, Co. C, 29th Iowa Volunteers; Charles G. Eddy, Sergeant Co. A, 24th Wis. Volunteers; Richard H. Elliott, Co. B, 83d Ill. Volunteers; David Elfick, 90th N. Y. Volunteers.

Charles I. Fancher, 13th Conn. Volunteers.

William H. Franks, 14th N. Y. Heavy Artil-

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lery; Henry D. Franks, Co. F, 7th Maine Volunteers; G. S. Frazey, 55th Ohio Veteran Volunteers; William F. French, Sergeant Co. H, 159th N. Y. Volunteers.

Franklin G. Galbraith, Co. H, 195th Pa. Volunteers; A. A. Q. Gardner, Co. H, 11th Ill. Cavalry; William N. Graham, Co. K, 15th Minn. Volunteers; John Geiger, Musician Co. G, 153d N. Y. Volunteers; James R. Gilmore, Co. A, 126th Pa. Volunteers; Martin E. Griswold, Co. F, 105th Ill. Volunteers; Julius M. Glasier, Co. C, 16th N. Y. Heavy Artillery; William Grasby, Co. K, 2d U. S. Infantry; J. K. Gullihuer, Co. F, 7th Ia. Infantry.

J. F. Halen, Co. A, 3d Maryland Volunteers; Charles A. Hammann, 18th Mo. Volunteers; C. D. Hammond, 136th N. Y. Volunteers; L. M. Harris, Co. A, 69th Pa. Volunteers; W. D. Hawkins, Co. A, 36th Ill. Cavalry; L. J. Hebard, 4th Wis. Cavalry; William N. Hicks, Co. C, 2d Kan. Cavalry; Paul C. Havens, Co. A, 112th N. Y. Volunteers; James S. Harrison, 44th Ill. Veteran Volunteers; O. E. Hoge, Co. E, 15th Ohio Infantry; H. T. Holden, Co. M, 2d Ohio Heavy Artillery; Spencer C. Holbrook, 8th N. Y. Heavy Artillery; James A. Howard, Co. A, 105th Ill. Volunteers.

William G. Kirkman, Co. G, 39th Ill. Volunteers; Joseph Knittle, Co. A, 47th N. Y. Volunteers.

Robert C. Laverty, Co. C, 195th Pa. Volunteers; Henry F. Lines, Co. B, 1st Ill. Battery; Ernest Lessel, Co. H, 15th Mo. Volunteers; William McClure, Co. B, 15th Pa. Cavalry; Alexander K. McMurray, Co. H, 52d Pa. Volunteers; William S. Maynard, Co. D, 20th Mich. Volunteers; Philip Martin, Co. B, 17th Mo. Volunteers; Dowling Mitchell, Co. C, 8th Mo. Volunteers; R. M. Matlocks, Co. A, 7th N. J. Volunteers; Wm. Moak, Co. D, 5th Ohio cavalry; — Montalvo, Co. E, 47th N. Y. Volunteers; Stephen Morcella, Co. G, 41st N. Y. Volunteers; A. M. Morris, Co. E, 13th Cavalry, M. S. M.; John Moltz, Co. D, 201st Pa. Volunteers; James J. Mulligan, Co. D, 69th N. Y. Volunteers; Wm. W. Murray, Co. C, 8th Mo. Volunteers; Robert I. Murphy, Co. I, 3d Pa. Artillery; John O. Mason, Chicago Mercantile Battery; James McMillen, corporal, Co. G, 33d Mo. Volunteers; James D. Maguire, 18th Mo. Volunteers; J. A. L. McKenna, Co. I, 102d Pa. Volunteers; James F. McIlvaine, Co. I, 48th N. Y. Volunteers.

Alfred T. Norman, Co. C, 127th N. Y. Volunteers.

J. Q. Olmstead; Michael W. O'Ryan, 7th Wis. Veteran Volunteers.

James Powers, Co. G, 15th Conn. Volunteers; George R. Penn, Co. H, 3d R. I. Cavalry; Henry P. Pyle, Union Light Guards, Ohio Cavalry.

Thos. Rawlins, Co. B, 129th Ill. Volunteers; D. E. Rand, Co. I, 1st R. I. cavalry; M. E. Roberts, sergeant, Co. H, 1st N. Y. engineers; D. P. Royce, sergeant, Co. A, 38th Ia. Infantry; John A. Raymond, Co. G, 9th N. J. Volunteers; Geo. Rice, 134th Ill. Volunteers; S. K. Rupley, Co. F, 150th N. Y. Volunteers; Chauncey A. Runyan, Veteran Reserve Corps, D. C.

John A. Sheridan, corporal, Co. G, 95th N. Y. Volunteers; George Sturgeon, Co. A, 56th N. Y. Volunteers; Thomas H. Sherman, Co. A, 15th Me. Volunteers; Robert M. Stopp, Co. A, 69th Pa. Volunteers; David Strow; Neal Steward, Co. H, 1st Mo. Volunteers; James A. Shrigley, Co. G, 3d Minn. Volunteers; Albert C. Snyder, Co. M, 19th Pa. Cavalry; Ed. Schermerhorn, Co. D, 5th N. Y. Heavy Artillery; Wm. K. Smith, 47th Ohio Volunteers; Dexter Smith, Co. A, 3d N. Y. Artillery; F. A. H. Sanborn, 12th Maine Volunteers; George Sturgeon, Co. A, 56th N. Y. Volunteers; Geo. H. Snyder, Co. E, 98th Pa. Volunteers.

A. C. Towne, musician, Co. I, 5th Mich. Volunteers; Henry C. Templer, Co. B, 13th Ind. Cavalry; James D. Truax, Co. C, 3d N. Y. Volunteers; Henry R. Trowbridge, sergeant, Co. I, 5th Ia. Cavalry; E. C. Tingle, Co. H, 32d Ohio Volunteers; John G. Toby, Co. B, 57th Mass. Volunteers; James D. Thurston, 41st Ohio Volunteers.

B. H. Upham, 8th Vt. Volunteers; S. S. Ulmer, 15th Maine Volunteers.

O. B. Vincent, Co. F, 148th Nat. Guards Volunteers; Robert B. Van Derholf, Co. B, 9th N. J. Volunteers; Jacob H. Van Gilder, corporal, Co. F, 156th N. Y. Volunteers.

H. M. Walls, 130th Ill. Volunteers; A. D. Williams, corporal, Co. H, 11th Ill. Cavalry; Leonard Whitney, captain, detailed May 10, 1864; W. H. Woodring, Co. D, 13th Ill. Volunteers; T. D. Waterhouse, 7th Maine Battery; W. B. Wood, Co. A, 124th N. Y. Volunteers; Stephen T. Wilcox, Light Guard, N. Y. Artillery; R. D. Williams, musician, 69th N. Y. Volunteers; W. H. Wilson, Co. K, 148th Ohio National Guard Volunteers; Wm. M. Worden, Co. E, 157th N. Y. Volunteers.

Charles Young, sergeant, Co. G, 38th Mass. Volunteers.

Strenuous Times, These!

We are passing rapidly from strenuous to more strenuous times. A hundred years ago our forefathers did not violate the queen's English when they chanced to miss a sailing vessel across the Atlantic and had to wait six months for the next. Fifty years ago our fathers swore but little when, perhaps, they missed a stage coach crossing the western prairies, and had to wait even in Chicago for thirty days.

Now a man swears viciously if he misses a train —even when going to work—and has a brain storm if he misses a street car.

But the limit was reached last week when a man in a Broadway office building had a nervous fit and broke a good pair of suspenders because he missed a compartment in a revolving door.—Judge.

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James Albert Partridge.

BY S. B. GIFFORD.

From a relative residing in Rockford, Ill., some facts have been learned in regard to the first telegraph operator in Syracuse, N. Y., who established the first office in that city May 1, 1846, the third to be opened on the line of the New York, Albany and Buffalo Telegraph Company, then in process of east and west construction, from Utica to New York, and Utica to Buffalo. His full name has not heretofore been correctly given.

James Albert Partridge was born at Onondaga Hill, a suburb of Syracuse, on April 17, 1814, and died July 16, 1868, in Washington, D. C., where he was in the government service for some time, occupying a position in the Treasury Department. He lies buried in the family plot in the old cemetery at Onondaga Hill. Prior to 1846 he studied law in Syracuse, and had commenced to practice there. When the telegraph was being introduced he went to Utica and qualified as an operator, opening the first office in Syracuse as stated; subsequently going to Buffalo, and later to Stockbridge, Mass., and was in the service in various places in New England, Hartford, Conn., being one.

From letters written to his family by Mr. Partridge while in charge of the office at Buffalo, some interesting items are taken relative to early telegraph operations and his experience.

On Monday, October 19, 1846, he wrote: "Broke down as usual. Every other day almost we are flat down, as far as being able to write by Telegraph. I am two hundred and fifty miles from the battery, a long stretch of wire, and broken very often. Saturday it snowed here all day and loaded the wire so heavily in the woods between here and Rochester that it broke in several places, and is not yet, 4 P. M., repaired, and no knowing how soon we shall start. . . We are having a new office finished off expressly for the telegraph, and hope to get settled thereby the 15th of next month. . . . 6 P. M.—Have been down to the cars to carry wire, etc., to send to my men on the line. The man that started yesterday morning down the line was at Attica this noon—several breaks lower down, and he was on his way to Batavia."

Under date of December 24, 1846, he says: "We are now fairly moved into our new office, in the second story of a brick building fronting on Exchange street, at the corner of Washington, and it is comfortable and pleasant. We are entirely alone. The operators' room has windows on Washington street, is separated from the bookkeeper's room and the public office. There is also a battery room and a bedroom. . . . The Toronto and Hamilton (Canada) line is in operation, fifty miles, between those places, and will be in operation and connected with the Lockport and Buffalo line about the first of January. All the operators who are on the line I have the honor of having instructed. Two more leave this office to-day to go on that line. . . . I have seen to-day a specimen of printing with common type by a telegraph instrument in black characters by a chemical preparation—not ink—on telegraph paper, an invention which I think must supersede the present system of raising the letters by a puncture. I have not seen the instrument, but if it works well must be the telegraph. Patentee's name, and invention even, not published yet. The papers have had a little of it, and call it Professor Morse's invention, but is not. . . ."

Pointers for a Successful Subscription Agent.

A subscription or advertising solicitor to be successful in his occupation should first study himself, ascertain his good and bad qualities, then try and overcome the latter and improve on the former, adapting himself with intelligent address to his business. Be natural; be enthusiastic; believe thoroughly in your work. As a well-informed agent speaking on the subject well said recently in a public address:

"Carry optimism with you wherever you go. Cheerfulness puts those around you in better humor and makes them more receptive to your appeals.

"Study politeness, not servility. Show the person you approach how you can help him. He is looking out for his own interests, not yours.

"Avoid dissipation, immorality or gambling. You must have clean morals if you would have good health, and good health is an absolute necessity to the solicitor.

"You cannot get business by knocking the other fellow. If you cannot put up arguments showing the superior advantages of the publication you represent it is usually your own fault.

"Never exaggerate the good points of your publication. Soliciting is not easy; in fact nothing worth having comes without hard work. Your disappointments will far exceed your orders, but don't worry. Getting subscriptions as well as advertisements is a slow process as you must patiently await results that are sure to follow persistent and intelligent effort."

A financial firm of London, pleased with the service afforded by the Commercial Cable Company, writes to that company in effect: "We should like to inform you of a test which, unknown to your office, we made as to the speed of a message between London and Havana. We despatched it from our office at 1 P. M. on January 17. There is a difference of 5 hours and 29 minutes in the time between the two cities, and the message was therefore despatched at 7.31 A. M., Havana time. Our correspondent writes that this message was received at the cable office in Havana at 7.34 A. M., and at his own office at 7.40 A. M., so that the transmission of the message from our office to his took only nine minutes."

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Meeting of the Western Old Time Telegraphers' Association.

The Western Old Time Telegraphers' Association held its banquet at Portland, Oregon, on February 22, meeting at the Lenox Hotel, that city. Around the banquet board were men who began sending "stuff" over the wires when a single line was strung around the world, and alongside of them sat younger men whose services began when the present-day telegraph wires began to web the earth.

In the East the Old Time Telegraphers' and Historical Association have held annual reunions, but the light of time bore heavily on the pioneer operators who settled on the Pacific Coast, so T. P. McKinney, now of Spokane, Wash., conceived the idea of a Western association of old time telegraphers. It is to him that the organization that met owes its birth and he has promoted something of which the fraternity of the Pacific Coast may well be proud. W. A. Robb, of Portland, president of the association, officiated as toastmaster and called first on Dr. O. P. S. Plummer, who started his work at the key in 1851. Then came John Henderson, whose career began in 1853, a man who handled the news of the Crimean War, the Civil War, and who received, while working at the key in San Francisco, the news of the assassination of President Lincoln. Mr. Henderson also told of the time when the telegraph company made the attempt to string its wire through to St. Petersburg by way of Victoria and across Behring Sea and Siberia.

J. S. Urquhart, who began in 1854, told of the time he met and knew Professor Morse, the inventor of the telegraph, and he, like others present, told of sending a message at one time to Professor Morse on the occasion of the latter's birthday. From Portland a message was sent to the great inventor by Dr. Plummer, which read: "Space is annihilated. The great Northwest greets you."

Among the other speakers were George H. Thomas, now a lawyer and Democratic leader, and W. R. McGarry, also a lawyer and the Republican candidate for Circuit Judge. Jeff W. Hayes gave an interesting talk of the olden times and told many amusing stories. Alexander Craib, secretary of the association, struck a happy note during his brief talk, when he suggested that the birthday of Professor Morse be honored by telegraphers throughout the country. Mr. Craib suggested that it would be a splendid thing on Professor Morse's birthday, at a given signal, to have all telegraph keys throughout the country remain silent for a moment as a token of respect to the great inventor.

Professor Morse was born at Charlestown, Mass., on April 29, 1791, and died in New York April 2, 1872. His remains lie in Greenwood Cemetery, Brooklyn, N. Y. During the repast a silent toast was drunk to the operators who have received "30." President Robb and Secretary Craib read a number of messages and letters from members who could not attend, and all of them closed with "73."

Those who attended the banquet and the date when they began their telegraph career, follow: O. P. S. Plummer, 1851; John Henderson, 1853; B. F. Carl, 1871; B. F. Jones, 1876; Jeff W. Hays, 1871; T. P. McKinney, 1876; Alex. Craib, 1872; I. J. Keffer, 1892; W. H. Guild, 1896; William Adams, 1889; W. F. O'Brien, 1890; L. R. Cowles, 1896; J. V. Reid, 1892; William Burt, 1889; H. W. Peterson, 1890; A. G. McClane, 1881; G. H. Thomas, 1878; J. S. Urquhart, 1851; W. A. Robb, 1884; B. S. Durkee, 1884; C. W. Lamar, 1886; William Ingold, 1883; W. A. Humphrey, 1880; A. E. Beamer, 1882; W. R. McGarry, 1880.

The English Telegraph.

The English postmaster-general's accounts for the year ended March 31, 1907, made public on February 22, of this year, show that on the telegraph and telephone services the expenditure exceeded the receipts by £643,698 ($3,218,470). The total income was £4,369,227 ($21,846,135). Telegrams, telephone rentals, private wire rentals, and special wire rentals brought in £4,592,525, but this figure is reduced by £536,050 paid to cable companies, and £4,350 telegram money refunded. The Post Office received £243,665 in respect to royalties from the National Telephone Company and other licenses, and the value of telegraph services performed for various public departments without remuneration is estimated at £73,437.

The gross expenditure was £5,011,926. Of this figure £4,027,665 is absorbed by salaries, superannuation and maintenance of the telegraph and telephone systems. The purchase of sites accounted for £11,665, extensions £306,376, repayment of capital £351,246, and interest £118,642. The Office of Works spent £79,693 in respect of erection, and £116,639 is put down to the expenses of other departments for various services rendered. The deficiency is the smallest since 1903. Capital expenditure on telegraphs and telephones had, on March 31, 1907, amounted to a total of £23,892,000 ($119,460,000).

Business Notice.

Mathias Klein and Sons are one of the best known makers of linemen's and of construction tools in this country. Just now this house is pushing their latest production in wire grips, that which is known as "Klein's Chicago grip," and this is advertised on another page, a cut of the same being shown in illustration. This grip possesses features that specially recommend it, and the firm are desirous of corresponding with intending buyers regarding the same. The Klein firm, whose address is 87-89 W. Van Buren street, Chicago, issue a 64-page catalogue, in which the merits of their well-known products are carefully set forth. It is full of valuable information, and those who are interested may obtain a copy for the asking.

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The Morse Electric Club Dinner.

The initial dinner of the Morse Electric Club was held on the evening of Saturday, February 29, at the Hotel Breslin, New York City. Covers were laid for nearly two hundred, the diners being seated at numerous round tables, the long table of the president occupying a position at one end of the room. Mr. J. B. Van Every, president of the club, was the toastmaster. At his right sat the guest of honor, Colonel Robert C. Clowry, president and general manager of the Western Union Telegraph Company, while at his left was placed Mr. E. T. Jeffery. Others at the president's table were. W. J. Dealy, A. C. Bedford, Charles C. D. Gott, I. N. Stevens and A. R. Brewer.

An excellent menu was served and at its close Mr. Van Every made a few introductory remarks, reciting among other things how it happened that he had been selected the first president of the club. He then introduced Colonel Clowry, who heartily thanked the members for the kindly expression of good will manifested toward him. He congratulated the club upon the success of its inaugural dinner and expressed the hope that many more such enjoyable occasions would mark its future course. He thought that a pleasant social feature attending the club's membership would be an annual summer outing, and said that he would be glad to put the telegraph company's cable boat, Western Union, at the disposal of the club as an aid in carrying out the idea.

President Van Every then read letters of regret from Melville E. Stone, general manager of The Associated Press, and Thomas F. Clark and George W. E. Atkins, vice-presidents of the Western Union company, all of whom were absent because of illness. A cable message was also read from T. W. Goulding, of London, European general manager of the Western Union, wishing for the club an enjoyable evening on the occasion of its first banquet.

William J. Dealy, who was then introduced, delivered a carefully prepared and interesting address, largely of an historical character.

E. T. Jeffery, of New York, president of the Denver and Rio Grande Railroad Company, was the next speaker. He made an eloquent address in which he had considerable to say relative to young men earning their way and enabling them to climb from the lower ranks to the higher positions within the gift of all corporate companies. Competent men, he declared, were never in such demand in all occupations of life as at the present time. He referred to his own business life which, like that of Colonel Clowry, he said, began at a very early age and at the lowest round. By his very environment he had been in intimate contact with men in all grades of employment, and the knowledge thus gained by association with workingmen enabled him to better fight the battle of life and fit him for promotion. He dwelt upon the dignity of labor and on the necessity of employer and employee working together in harmony at all times. This could and should be done and unless a proper esprit de corps was securely established in corporative bodies such organizations could not hope to prosper. Mr. Jeffery declared for the spirit of individual character, also impressively remarking that the sympathies of a vast majority of those holding high official positions were always with the workingmen.

Mr. I. N. Stevens, of Denver, Colo., a guest of the club, also made an admirable address. He was followed by A. R. Brewer, who related a few telegraph stories of an entertaining and interesting character. A. C. Bedford, of the Self-Winding Clock Company, followed Mr. Brewer and gave a five-minute interesting talk. A few remarks by C. W. Price, Editor of the Electrical Review, brought the speech making to an end.

Mr. Van Every proved himself to be a most acceptable presiding officer, being particularly happy in his introductions, which usually carried with them some appropriate and interesting story or historical reminiscence relating to the telegraph profession.

The musical entertainment was of a high order and was interspersed with monologue recitations and story telling.

The committee of arrangements included Gardner Irving, M. J. O'Leary, P. J. Casey, J. A. Hill, M. H. Kerner, Gerald Brooks, F. J. Scherrer and R. J. Murphy.

Among those present were:

Albany, N. Y.—T. J. Meade.

Boston, Mass.—C. F. Ames.

Buffalo, N. Y.—W. A. Sawyer.

Cincinnati, O.—C. R. Tilghman.

Denver, Colo.—I. N. Stevens.

Hartford, Conn.—Elisha Ryder.

Jersey City, N. J.—J. B. Bertholf.

Newark, N. J.—W. H. Spry.

New Haven, Conn.—C. F. Annett, F. E. Clary.

Newport, R. I.—H. J. Lockrow.

New York—W. J. Austin, W. J. Ackerly, Harry Ayres.

T. M. Brennan, B. Brooks, J. A. Berry, G. J. Bascom, E. E. Brannin, E. T. Burrill, J. R. Beard, Gerald Brooks, G. R. Benjamin, Orton Brewer, E. C. Brower, C. J. Bresnan, A. R. Brewer, C. A. Bauer, J. W. Behre, A. T. Benedict, F. E. Brouwer-Ancher, G. E. Baker, A. C. Bedford, R. D. Brixey.

Col. R. C. Clowry, P. J. Casey, A. R. Carmichael, J. T. Carberry, J. W. Connolly, F. E. Coyle, E. G. Carley, F. R. Carney.

W. J. Dealy, Martin Durivan, Lewis Dresdner, J. T. Delaney, J. P. Doyle, Harry Durland.

H. D. Estabrook, J. W. English.

W. N. Fashbaugh, E. H. Falls, Wm. Finn, Wm. Finn, Jr., David Fuchs, Louis Fiedeldey, Irving Fish, S. H. Flagler, L. B. Foley.

F. D. Giles, E. P. Griffith, D. J. Gallagher, J. J. Ghegan, C. H. Gaffney, Chas. C. D. Gott.

J. A. Hill, M. W. Hamblin, M. J. Hayden, H. M. Heffner, G. A. Holle, J. F. E. Hopkins,

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E. F. Howell, F. C. Halstead, Wm. Holmes, F. X. Hickey, Wm. H. Hurst, Thomas Hull, M. O. Hoffman.

Gardner Irving.

W. H. Jackson, Chas. Jacobson, C. H. F. Johnson, M. W. Jones, E. T. Jeffery.

Frank Kitton, M. H. Kerner, James Kempster, A. F. Kelly, C. A. Kilfoyle, Alex. Kline, Oscar Kuehn, M. J. Kenna.

J. T. Laidlaw, A. M. Lewis.

W. T. Mapes, R. J. Murphy, E. M. Mulford, C. A. Meyer, Major Mitchell, R. F. Murphy, Edward Mesler, William Marshal, Mr. Murray, F. A. Mombert, G. H. Messner, C. H. Murphy, T. A. McCammon, D. W. McAneeny, W. A. McAllister, J. F. McGuire, Joseph McCusker, A. A. McNeill, T. F. McAvoy.

J. F. Nathan, Benjamin Nachmann, H. J. Northrop.

M. J. O'Leary.

Frederick Pearce, R. F. Parkinson, J. M. Phelan, C. W. Price, W. W. Price, M. E. Pierce, W. E. Paine.

W. E. Rath, H. E. Roberts, C. E. Rice, A. J. Roberts, B. H. Reynolds, T. E. Russell, George Roehm, J. J. Riley, C. D. Reed, James A. Rice, D. Roth.

F. J. Scherrer, G. F. Stainton, T. G. Singleton, A. G. Saylor, Daniel Skelton, John Simmonds, J. W. Schmults, Herbert Smith, H. A. Smith, H. L. Shippy, W. D. Schram, F. G. Sherman, H. V. Shelley, W. A. Schudt, George Schreiner, J. A. Sweeney, D. C. Sullivan.

P. J. Tierney, J. C. Turner, J. B. Taltavall, F. A. Taylor.

J. B. Van Every, H. E. Van Every, E. B. Van Every, J. Veitch.

M. T. Wilbur, J. Wiseman, H. C. Worthen, A. O. Wallis.

Philadelphia—J. P. Altberger.
Pittsburg, Pa.—E. B. Saylor.
Portsmouth, Va.—W. F. Williams.
Rochester, N. Y.—G. D. Butler.
Saratoga, N. Y.—H. L. Waterbury.
Schenectady, N. Y.—A. E. Reynolds.
St. Johns, N. B.—D. C. Dawson.
Syracuse, N. Y.—J. E. Bierhardt.
Troy, N. Y.—I. W. Copeland.
Utica, N. Y.—F. E. Howell.

Why Wooden Poles Break Above Ground.

BY CLINTON B. SMITH.

It is a matter of observation that most tall wooden poles of, say, forty feet and over in length, when blown over by storm, will break a considerable distance above ground.

This fact would lead one to think that the weakest section is not at the ground level, but at some higher point on the pole. The following investigation shows that a pole of uniform taper and free from knots and other local weaknesses is weakest at a definite distance from the top, this distance being independent of the pole length.

This distance is $x = d \div 2t$ in which all distances are in inches, and in which d = diameter of the pole top; t = taper of pole, or increase in diameter in inches per inch of length; F = horizontal stress due to wires on crossarm.

The pole is weakest where the fiber stress is greatest. Therefore, in order to find the weakest point, it is necessary merely to locate maximum fiber stress for any value of F.

At any section along the pole at a distance x from the top,

$$Fx = \frac{If}{e}$$

$$= .098\ dx^3 f \text{ (for round section)}$$

where I = mom. of inertia of section.
f = stress in outer fiber.
dx = diam. of pole at distance x from top.
but $dx = d + tx$.
Therefore

$$f = \frac{F}{.098} \frac{x}{(d + tx)^3}$$

It will be observed upon differentiating that f reaches its maximum value when $x = d \div 2t$. This is the critical value of x corresponding to the maximum value of f, the fiber stress; the pole, if free from local weaknesses, will break at this distance from the top.

Taking the case of an Idaho cedar pole having a top diameter of eight inches and an average taper of .01 inch per inch.

$$d = 8$$
$$t = .01;$$

whence,

$$x = d \div 2t = 400 \text{ inches.}$$

Hence the pole will break thirty-three feet four inches from the top, no matter how long the pole may be, provided the pole has at least this length above ground. A pole shorter than this length above ground will break at the ground.—Electrical World.

The new officers of the Self-Winding Clock Company of New York, elected at a meeting of the company, held on March 2, were A. C. Bedford, president; C. M. Pratt, vice-president; Charles C. D. Gott, vice-president and general manager; Harold I. Pratt, secretary and treasurer; George A. Vaughn, assistant treasurer.

Small things are not to be overlooked in considering the problems of the future timber supply. The matchmaker is having as much trouble in getting the grade of wood necessary for his business as are the telegraph companies in obtaining their pole supplies.

The testimony of progressive operators is that TELEGRAPH AGE is so thoroughly comprehensive in character as to make it absolutely indispensable to those who would keep informed. Its technical articles are of high practical value. Write for a free sample copy.

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George W. Balch and the Telephone.

The late George W. Balch, of Detroit, Mich., whose death is referred to in another column, was president of the Telephone and Telegraph Construction Company of that city in 1878, the first telephone exchange established anywhere in the world and made the first practical demonstration of the use of the telephone.

William A. Jackson, of Detroit, chairman of the executive committee of the Michigan Telephone Company, and who, like Mr. Balch, was an old-time telegrapher, in referring to the death of Mr. Balch, said:

"I recall very distinctly when, in 1877, Mr. Balch, with orders, took up the development of the telephone as a commercial enterprise. The year before it had been exhibited at the Centennial exposition at Philadelphia, but it had never been used, except as one might inspect a curiosity.

"In 1877, with Mr. Balch as president, eight of us organized the Telephone and Telegraph Construction Company, there being associated with Mr. Balch, James McMillan, Hugh McMillan, John S. Newberry, W. K. Muir, M. D. Woodford and Charles Reed, with myself as general manager.

"We had heard wonderful stories of the invention of Mr. Bell, and Mr. Balch, I believe, at the Centennial had seen the instrument, which was then a mighty crude affair. Previous to the organization of the company, we had sent to Mr. Bell for a couple of the machines, as they were called, and we tried them out with an experimental line from the old office of the Detroit Free Press, which was then located at Woodbridge and Griswold streets, to the American District Telegraph Company's office. Hundreds of persons inspected the machines and the invention was pronounced marvelous.

"Mr. Balch, however, had little confidence in the thing as a practical business enterprise, nor did any of us, but it was decided to try it out, anyway, and a few telephones were installed. The first one put in and the first contract ever made for a telephone anywhere in the world was made by our company, while Mr. Balch was president, and Frederick K. Stearns was our first customer. Mr. Balch thus signed the first contract ever made for telephone service. We didn't have an exchange for some time, and I can recall the names of nearly all of the first subscribers.

"Mr. Stearns had a line from his store, at Larned street and Woodward avenue, to his laboratory, at Woodbridge and Fourth streets. The Michigan Car Company took the next one, and our fourth subscriber was the Detroit Water Works.

"In 1878 an exchange was established. This was the first exchange in the world. There were then about forty subscribers and the system was as much different from the arrangement of the present time as can be imagined. There were only four or five lines with eight and ten subscribers on each line. The 'phones had no transmitters and it was a case of yell into the receiver and then put it up to your ear to listen to what the party on the other end had to say.

"At that time no one had thought of using the telephone as a means of communication between towns, but in 1879 we decided to try it for this purpose, and the first outside line was from Detroit to Port Huron."

The Telautoprint.

The United States Wireless Printing Telegraph Company, of San Francisco, in a general circular states that "the principle on which the Telautoprint operates is this: Beneath the Telautoprint machine, occupying a floor space eighteen inches square, is a small dynamo which operates a revolving type wheel on the machine above. When one presses a letter on the keyboard, the touch of the key whirls the type wheel; on this is cut the characters of the typewriter, the right letter stops at a point electricised by opening the circuit; it is printed on paper, and the electric impulse passes over a telegraph wire or through the air as far as messages can be sent. The type wheels on both the sending and receiving machines move with absolute uniformity. This is the achievement of A. H. F. Schaar, the inventor. By gauging the speed of any revolving type cylinders, a message can be sent which no one can intercept."

Changes in the New York and New Jersey Telephone Company.

At the annual election of officers of the New York and New Jersey Telephone Company, held in Brooklyn, N. Y., on February 27, Theodore N. Vail was elected chairman of the board of directors. Union N. Bethell was re-elected president; W. D. Sargent was re-elected vice-president; H. F. Thurber, formerly general manager, was elected second vice-president; Waldron Hoppins was re-elected secretary, and Ford Huntington, treasurer of the New York Telephone Company, was elected treasurer in place of H. S. Snow. Walter Brown was elected auditor in place of J. L. Hamar, who will serve the company in another capacity. John C. Reilly, who has been with the company for twenty-five years as general superintendent, general manager and vice-president, resigned as vice-president and will assume important duties assigned by the president.

It has recently been decided to arrange for an international congress of the applications of electricity, in connection with the Marseilles Exposition, which will take place at Marseilles from September 14 to September 21. A committee of organization is being formed and its personnel will be published later. This congress will have general meetings, section meetings, lectures, and visits to various industrial establishments. Manuscripts may be sent to the general secretary of the exposition, 63 Boulevard Haussmann, Paris, France, before July 15, 1908.

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Radio-Telegraphy.

All the self-governing British colonies, except Newfoundland and Orange River Colony, have decided to adhere to the Radio-telegraphic Convention.

It is reported that the German naval authorities are about to witness a demonstration of a boat which is dirigible by electricity without the aid of wires, the invention of three German engineers.

In the course of experiments with the wireless telegraph apparatus at the Eiffel Tower, Paris, on February 18, an explosion occurred which destroyed the greater part of the installation, and a fire broke out which completed the havoc and caused damage estimated at $16,000.

A mathematical paper, entitled Directed Wireless Telegraphy, by A. Montel, shows that an antenna composed of two vertical wires of equal length placed at a certain distance from each other and supplied with currents of opposite sign at any instant has the property of sending out waves in certain directions.

A patent, No. 879,532, for space telegraphy, has been taken out by Lee De Forest, of New York, assignor to the De Forest Radio Telephone Company. An oscillation detector comprising an evacuated vessel has two electrodes enclosed within the vessel; also shaped member of conducting material inclosed within the vessel and interposed between the electrodes. This is the De Forest "Audion" receiver.

A patent, No. 879,409, for wireless telegraphy, has been granted to George W. Pierce, of Cambridge, Mass. In a receiving system for wireless telegraphy are comprised an inductive connection having a variable primary and variable secondary, a detector and a condenser connected with the secondary, and connections for sending the currents set up in the primary of the inductive connection through the detector.

It is announced that the English Admiralty have had under consideration for some time the question of the general supervision of wireless telegraphy in the British fleet, and have decided that in every fleet and squadron there shall be an officer appointed who has received special training in wireless telegraphy. The duties of this officer will be to supervise personally wireless telegraph exercises and instruction of operators, as well as to go from ship to ship and tune the various instruments.

The Marconi Wireless Telegraph Company of America, which will hold its annual meeting in the third week in March, was incorporated in 1899 with a capital stock of $6,650,000, par value $100, of which $6,190,000 was issued. The experimental transatlantic station at Glace Bay, Nova Scotia, was thrown open February 1 of this year for service limited to Montreal. The station has an operating capacity, it is said, of about 10,000 words a day. The annual report will, it is stated, show a gross monthly business of about $5,000 for 1907 over a monthly business of $1,100 for 1905.

Charles Bright, of England, publishes in an English journal an interesting comparison between submarine telegraphy and radio-telegraphy, pointing out the certainty and speed of the former, and the possibilities of the latter, notwithstanding its present limitations. The future of wireless telegraphy depends to a large extent upon (1) the working capacity of a pair of stations, (2) how near stations can be placed without interference, (3) whether the electric power required will militate against the use of other stations and ships in the neighborhood or passing within range, and (4) the amount of traffic secured.

Post Office Engineers' Dinner.

The fifth annual dinner of the engineering department of the English post office was held at London, on February 1, Major O'Meara, C. M. G., R. E., engineer-in-chief, presiding. The guests of the evening included the Right Hon. Sydney Buxton, M. P., postmaster-general; Babington Smith, C. B., C. S. I., secretary; A. F. King, H. S. Carey, A. M. J. Ogilvie, Sir John Gavey, C. B., Sir John Cameron Lamb, C. B., C. M. G., Hon. R. D. Danman, Lieut-Col. Price, C. M. G., Dr. Glazebrook, Dr. Walmsley, G. Morgan, A. E. Eames, J. Kingsbury, H. Hirst, J. W. Willmot and others.

After the royal toasts had been duly honored, Mr. Sydney Buxton, in proposing the toast of the "engineering department," referred to the loss of Lord Kelvin and Mr. Blaine, and to the retirement of Sir John Gavey, who, however, was retained to keep a watching-brief over various matters which might occur in the future, perhaps the most serious of which would be the tussle with the National Telephone Company in 1911. In the engineering department they had two difficulties in the way of carrying out their duties; one was the question of wayleaves, and the other the question of money. On the question of wayleaves, he was endeavoring to pass a bill through the House of Commons, which would give them greater powers of dealing with the obstruction of individuals. There was another body also with which they had to deal—the treasury, which was far and away above the postmaster-general. However, in spite of this they had been able to make considerable strides in the direction of the extension of the telegraph and telephone lines and wires. In the last twelve months no less than 123,000 miles of telegraph or telephone wires were laid.

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$1.50 a year.

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A Reminiscence of Forty Years Ago and its Modern Termination.

BY E. C. GREENE, OF SEATTLE, WASH.

An incident having its beginning forty years ago with a denouement of recent date, will be of interest to old-timers, particularly those familiar with Pacific Coast telegraphy in the early days. It also holds up vividly to view by way of contrast, the hard physical and savage conditions of the country then confronting the pioneer in the Far West, with those of the present day when under the softening influences of civilization much of the land veritably blossoms as the rose, inviting in its allurements as a place of residence.

In 1868 the Union Pacific Railroad was under construction, the first iron roadway to link the distant West with the East. The recent conclusion of the Civil War had made clear the desirability, nay, the necessity, almost, of such a road. It was needed not alone for traffic, although a vast amount awaited its completion, but it was required also to operate as a strengthening bond of unity between two widely separated sections of the country divided by a wilderness and so-called "desert" tracts. The days of the "prairie schooner," which had served the overland traveler so long, yet which had made the wearisome journey across the plains, one subject to constantly impending danger, not alone from savage beast, but, more to be dreaded, from savage men, white as well as red, were happily drawing to a close. The trip from the Mississippi to the Golden Gate would soon be a question of days only, instead of weeks. The work of railroad building, stimulated by government aid, was being pushed westward with unusual energy and speed. From the Coast the Central Pacific Railroad was under construction with equal expedition eastward, aiming to meet and unite with the advancing Union Pacific, and so complete a great transcontinental railway system.

At this time there were four telegraph operators, by name, "Dick" Wood, "Al" Haight, D. B. McCoy and George Gilbert, in the employ of the Union Pacific Railroad, who were accompanying the advance party of construction. Their common avocation served naturally under the circumstances to bind them close to each other and they became companionable and fast friends. As the two great railroad undertakings gradually neared the point of junction, the four friends moved by a spirit of restlessness, an unexplainable desire to change, such as will sometimes seize upon men, particularly when brought under undefined frontier influences, perhaps because of the very roughness of environment—but at any rate, whatever the impelling cause, the telegraphers determined to throw up their present job, tramp over the intervening distance then separating the respective roads in the race of construction, estimated to be about one hundred miles, and seek employment with the confronting company.

While the trail which they expected to follow between the two distant points was known in a general way to be a rough one, it was believed that but a few days at most would be sufficient to cover the interval, although there were those who counseled against the undertaking, particularly in the inclement winter season. But the telegraphers were young and stout-hearted and fond of adventure. Besides, they argued, so far as the questions of nightly shelter and rest and largely that of food affected their well-being, settlers along the route would afford all that might be necessary in these respects. It was estimated that a settler's cabin, or "farmhouse," as "Dick" Wood ventured to dignify probable stopping places, would be met with on an average of every ten miles or so, and if such was the case no trouble need be apprehended so far as the safety and comfort of the journey was concerned. In fact, the prospect was viewed more in the nature of a picnic, or a holiday excursion, rather than as a serious undertaking likely to be beset with difficulties and possible disaster. So it was that with light hearts, fortified by that happy-go-lucky spirit observed in some members of the telegraphic fraternity, but more frequently noted in the early frontier days than now, inclining one to take big chances, the four friends started out on their long tramp.

A spurt on the first day, prompted by exuberance of spirit, hopefulness and confidence in physical strength, carried them well forward into the wilderness. The further they proceeded the wilder, more rugged and more forbidding became the pathway. They looked in vain for a sign of a human habitation that was presumed to exist, but evidently the settler was to follow not lead the advent of the railway. The latter might bring him forward, but he was not waiting to welcome the arrival of the iron horse, even though the telegraph had previously stretched its line across the plains and over the mountains. So sure were the migratory operators that they would meet with friendly assistance on the way that they had foolishly neglected to provide themselves with blankets even as a protection against the chill of night—in fact, they were but comparatively thinly clad. As for provisions, they had only scanty store, relying almost wholly on the expected generosity of the dwellers by the way. When, therefore, night closed down cold and cheerless, and the four gathered closely around a camp fire and partook of but a slight repast from the little stock of provisions which it now became evident they must carefully husband, it must be confessed that the absence of the warm fireside under some hospitable roof, and the hot supper, even though a plain one, so confidently counted upon, was a keen disappointment, and the courage of the shivering group sank in corresponding measure. The outlook was a dubious one and the boys began to question the wisdom of their move. To abandon the undertaking and go back was, they declared, not to be thought

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of. Only ridicule would meet them on their return. With the morning sun, however, hopes arose in corresponding measure, as that luminary's glow dispelled darkness and brought light and some degree of additional warmth. After a hurried breakfast, which was not much more than a mouthful all around, a pittance to hungry men tired and stiff from lack of sleep, the little party once again resumed their march with renewed confidence, the buoyancy of youthful assurance coming to their rescue.

The second day was practically a repetition of the first, and the third of the second. It was plain they were not to meet with "farmhouses" along that "right of way." No clearing or twinkling lights appeared to gladden their sight and hold out a welcome as the twilight deepened night after night. The picnic idea which filled their minds at the outset, had long since disappeared. They were facing a stern, adverse reality of hunger and utter weariness of body that seriously threatened their very existence. The country over which they were now but slowly making their way, for each day's progress became less and less marked, became more rough and difficult of passage. It had originally been formed when nature was in a disgruntled mood.

Of game there appeared to be but little, and from this source their wants were but narrowly supplied. Besides, it was necessary to exercise close economy in the use of powder and shot, of which they had but limited store, for it might become necessary to meet an attack by wild beasts or by Indians, although of the latter little dread was felt. Indeed, they might have welcomed falling in with a roving band of redskins, for that might be the means of obtaining food. It need hardly be said that the telegraphers now bitterly repented of ever having started out so blindly and so ill prepared for the journey they were making. The sound of the key would have been as music in their ears, and the rough surroundings which they had abandoned so thoughtlessly would now have been welcomed as a haven of rest. To add to their distress, on the seventh day out a storm set in which developed into a raging blizzard, during which the men became separated and their sufferings grew intense. They frequently remarked afterward that in their weakened condition they wondered how it was they ever survived the ordeal through which they passed in that storm. It was a struggle for life, yet realizing that if they gave way at all they would be lost, indeed, they still wandered on, each man in despair almost at his isolated, lonely and utterly forlorn condition. But, luckily, they were nearer their journey's end than they imagined, and when at length the men became united and the camp of the Central Pacific Railroad builders was almost stumbled upon, they had about reached the limit of physical endurance. A few days' rest, however, restored the weary trampers, and their services as telegraph operators were called into requisition.

The hardships of frontier life and its generally unsatisfactory conditions, holding out but few opportunities for profitable, or at least satisfactory, employment, caused Haight, McCoy and Gilbert after an interval of a year or so, to return East. "Dick" Wood, the master spirit of the "original four," went to California, where all definite trace of him was lost, and where he was supposed to have died.

Now comes the sequel to the story. A few days ago a gentleman, well along in years, called on the writer, in his capacity of hotel broker at Seattle, Wash., explaining that he thought of engaging in the hotel business, and inquired respecting the outlook of such an undertaking. In response to questioning he said he had been engaged in the hotel business years ago at Saginaw, Mich., not, however, as manager, as I queried, but as a "bell boy." It was sufficient that he was familiar with Saginaw, and the question was put:

"Did you ever know Alexander Ferguson, manager of the Western Union Telegraph Company in Saginaw?"

"Well, well," said he, "I have not heard that name in forty years. Ferguson was a father to me; he taught me telegraphing."

The further question of whether he ever knew "Al" Haight, who was from Jackson, Mich., brought the exclamation:

"Did I know him? Well, I don't think I will ever forget him. He, I, and two others took a foolhardy trip forty years ago that came near killing us."

Then he told the story as related herewith. It was "Dick" Wood who was talking. He said he had separated from the boys, drifted into Southern California, had married, owned two private banks in Arizona; when the panic of 1893 struck him he lost his fortune. He then went to Seattle, where he has since resided. He explained that he had a son, a part owner in the largest banking institution at Fairbanks, Alaska.

Verily, this is a small and strange world! Think of running into a friend forty years after he is supposed to be dead, and find him with a hotel fever coursing through his veins that has coursed forty-five years unchecked!

When the Union Pacific and Central Pacific (the latter now a part of the Southern Pacific system) effected a connection in March, 1869, the writer was an operator on the summit of the Sierra Nevada mountains. The last time I saw D. B. McCoy, he was a night chief in the Western Union office, New York (where he now is); "Al" Haight was in the Western Union employ in Chicago, in which city, also, George Gilbert was working the wire in a broker's office. At the time I was on the mountain summit John Ginty was a fellow operator there, and Henry D. Underwood, an operator, was filling the position of clerk in the Summit Hotel. Five years ago we three had a reunion at Los Angeles, Cal., after a separation of thirty-five years. Mr. Ginty is now cashier of the French-American Bank, at San Francisco, and Mr. Underwood after a successful experience of thirty years in the real estate and insurance business at Tucson, Ariz., has lately

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moved to Los Angeles, where he is engaged in the same line of business.

In recalling the names of these former friends and associates, permit me to add that while I was on the "summit," James K. Parsons was stationed as an operator at Colfax, Cal. For the last thirty years he has worked in the Western Union office at Rochester, N. Y. I had lost track of him, but located him through a communication of his in Telegraph Age. At Cisco, Cal., there was John Clark, who came originally, I think, from Buffalo, N. Y., and who is now dead.

LETTERS FROM OUR AGENTS.

PHILADELPHIA, WESTERN UNION.

Mr. C. M. Pennypacker, formerly of New York, has been placed in charge of the Barclay department in this city.

Patrick H. Nunan, after a long and painful illness, died in this city on March 9, aged sixty-six years. He entered the service about 1862 and has been in its continuous employ ever since. He was a member of the United States Military Telegraph Corps and had just received his pension from the Carnegie fund. He has been very feeble of late years owing to nervous prostration.

Miss Margaret Waddell, who went to Atlanta, Ga., during the strike, and who remained South, locating at Mobile, Ala., is shortly to be married to the chief operator, Mr. F. H. Austin, of that city.

NEW YORK, WESTERN UNION.

Mr. R. J. Welch, formerly of this department, died at Seaton Hospital, in The Bronx; the interment was in St. Joseph's Cemetery, Boston, Mass.

Mr. T. A. Brooks, timekeeper of this department for over a quarter of a century, and who a month ago went to Florida for the benefit of his health, is reported to be much improved, and his early return is now expected.

OTHER NEW YORK NEWS.

Mr. G. W. Hickey, a well-known old-time telegrapher of New York, was married recently and is now absent on an extended wedding trip, which will include visits to Florida, Nassau and Cuba.

The Magnetic Club of Philadelphia.

At the annual meeting of the Magnetic Club the following officers were elected: F. H. Lincoln, president; J. W. Reed, vice-president; C. B. Wood, secretary; H. W. Hetzel, treasurer; John W. Meyer, chairman of governing committee, and C. C. Ingalls, W. S. Burleigh, E. C. Boileau, F. E. Maize, A. S. Weir, to serve for two years on that committee.

The next club dinner will be a planked shad one at Washington Park, on the Delaware, on May 23.

Book Review.

Telegraph Age is in frequent receipt of enquiries for a low priced yet a reliable and practical work on submarine telegraphy. Such a book has recently made its appearance bearing the title of "Submarine Telegraphy," compiled by competent authority, and brought out by S. Rentell and Company, the London publishers. It is a volume so clear and complete in its discussion of the subject treated as to render it a valuable possession to all who may be interested. The price is seventy-five cents and it will be sent to any point on receipt of the price, carrying charges prepaid. All orders should be addressed to J. B. Taltavall, Telegraph Age, 253 Broadway, New York. There is a growing demand for books of this class and this journal is prepared to promptly fill all orders for same as well as for telegraph and electrical books in general.

W. H. Magehan, Former Military Telegrapher.

William Henry Magehan, of Webster Grove, Mo., a Pullman car conductor, is an old-time and United States military telegrapher. He was born at St. Louis, Mo., July 14, 1839, and entered the telegraph service in that city about 1853, in an office which had for its manager A. Peting, and in which Col. R. C. Clowry, now president and general manager of the Western Union Telegraph Company, was the only operator. In this same office a Mr. Tupper was the agent for The Associated Press, and who was relieved later by C. J. Osborn. Subsequently Mr. Magehan became an operator and while at Sulphur Springs, Mo., in 1862, became a military telegrapher, being stationed first at the St. Louis arsenal and afterwards under different commanders, serving in the army in the field in Missouri until 1865. Following the Civil War he entered other avocations, but returned to the key in the railroad service, where he remained about eighteen years. Deafness compelled his withdrawal from telegraph employ nearly thirty years ago, since which time he has followed his present occupation.

The drastic postage law affecting rates of postage between this country and Canada, which went into operation some months ago and which caused rates to be advanced to an almost prohibitory figure, has been abrogated so far as the daily papers are concerned. It is a matter of regret and disappointment that high rates are still demanded on all other classes of periodicals, including, of course, Telegraph Age.

Mr. Harrison Osborne, attorney for the United States Electric Company, who is well known in railroad telegraph circles, has been appointed attorney for the United States Custom House in New York.

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Representative Andrew J. Peters, of Massachusetts, introduced in the House of Representatives on March 10, a bill providing punishment by a fine not to exceed $2,000, or imprisonment not to exceed one year or both, of any person found guilty of originating or transmitting a false wireless message purporting to be official.

The Western Union Telegraph Company has instituted suit against the state of Wisconsin to recover $12,886, which it alleged was paid as excessive taxes in October, 1907. The complaint says that under the ad valorem law the company's property within the state was assessed at $1,800,000, whereas the true value was but $653,544.

The Hearst leaguers who propose the establishment of a new political party to be known as the "National party," suggest as its slogan a declaration favoring public ownership of all public utilities whenever municipal, state and national governments are in a position to undertake such enterprises, and the immediate purchase of the telegraph lines by the United States government is advocated.

In Boston on March 4, 5 and 6, a sale occurred at auction of the valuable private library of the late Joseph Barker Stearns, the inventor of the duplex system of telegraphy. The sale brings to mind the death of Mr. Stearns, which occurred July 4, 1895, at his home at Camden, Me., where he lived in retirement, enabled so to do from the ample income derived from royalties on his invention received from telegraph and cable companies.

R. L. Dean, of Kansas City, Mo., president of the Dean Rapid Telegraph Company, in renewing his subscription lately, took occasion to write as follows:

"In renewing our subscription to Telegraph Age, please allow me to say that no man who expects to keep posted on electrical science, and especially the art of telegraphy, can afford to be without your paper. And the fact that Telegraph Age treats every article from an unbiased standpoint, makes it more valuable to its readers. I wish your paper success and trust it will continue to maintain its present high standard of excellency."

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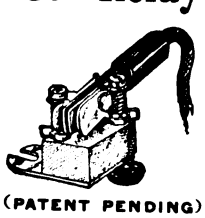

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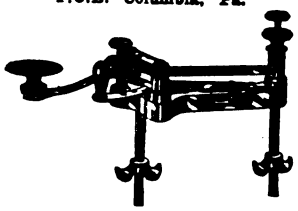

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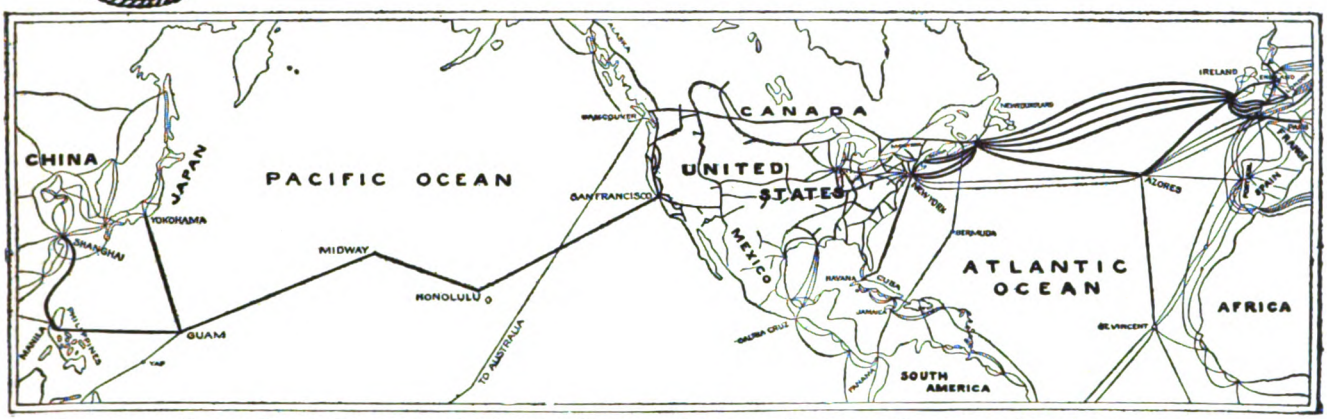

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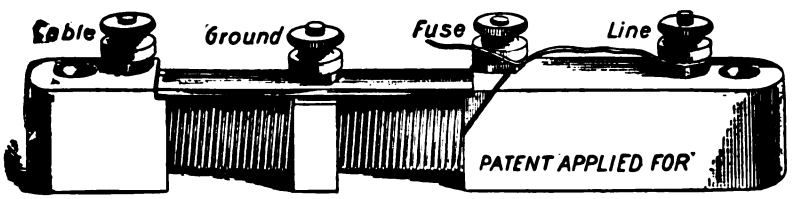

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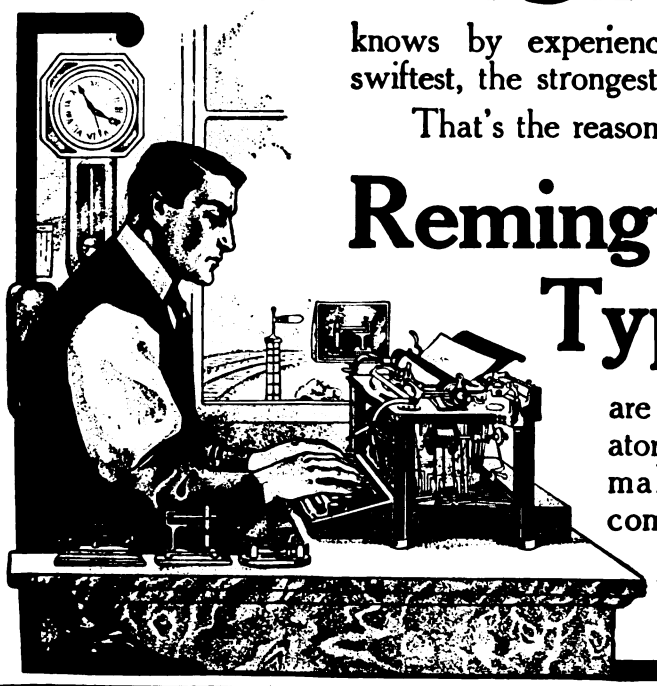

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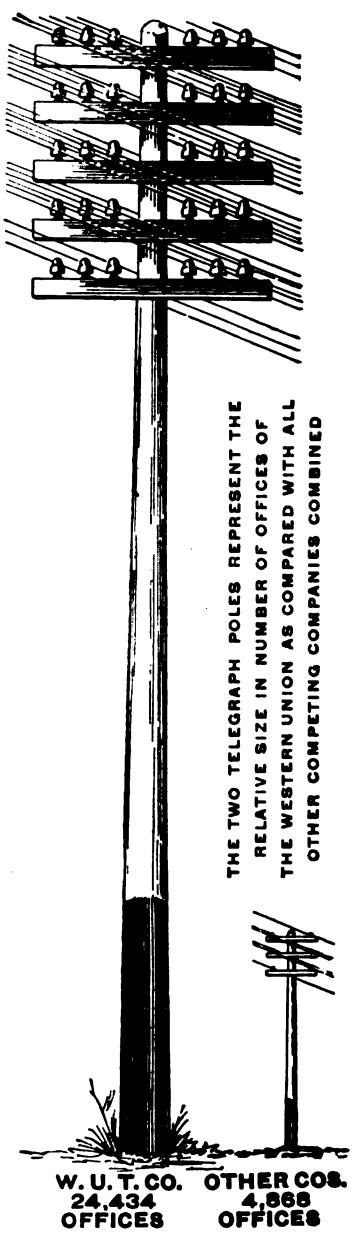

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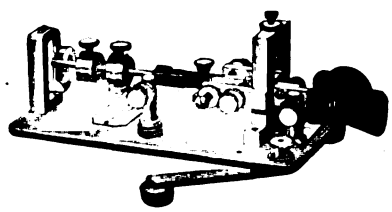

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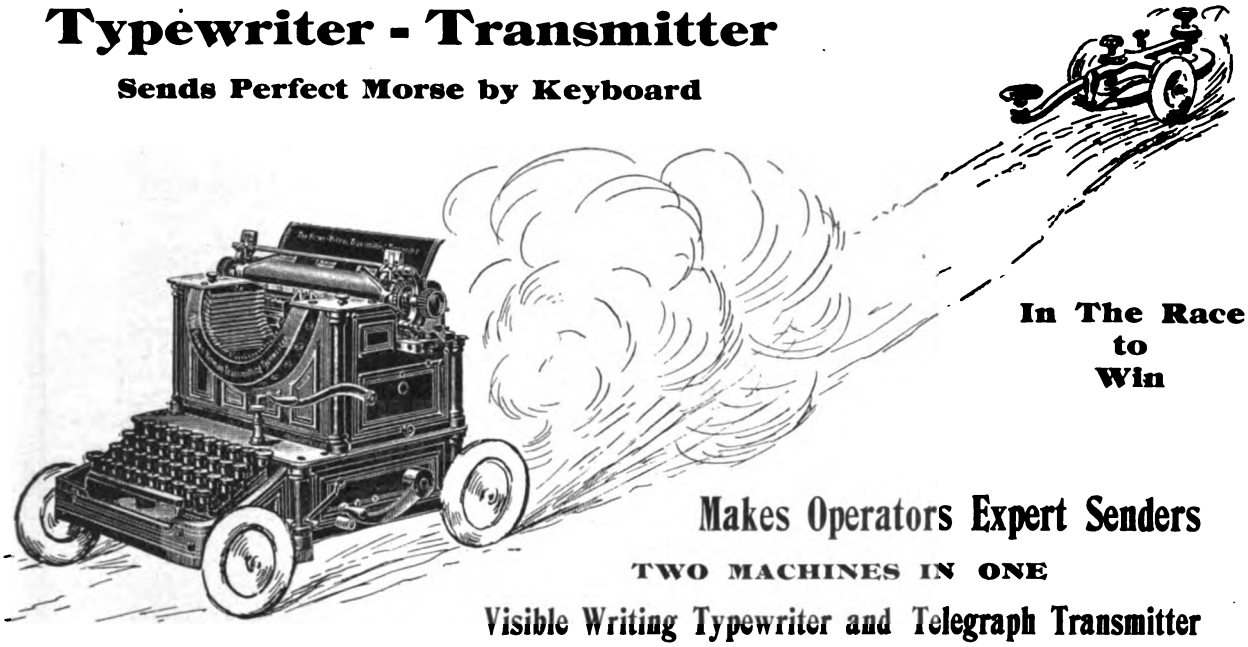

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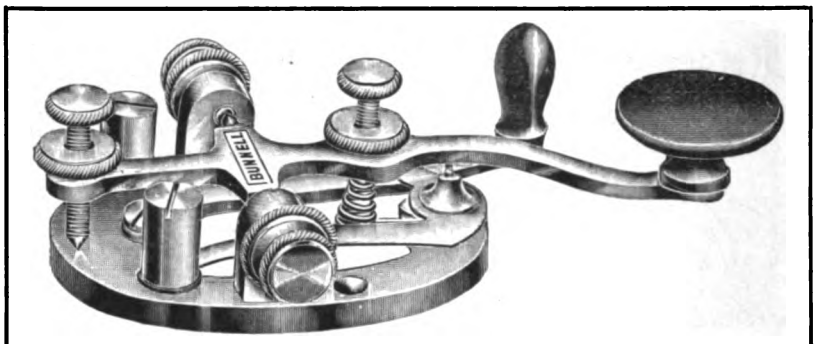

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No. 7. NEW YORK, APRIL 1, 1908. Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

A Practical Remedy for Neutralizing the Effect of Induction in Telegraph Apparatus.

BY WILLIS H. JONES.

The most potent factor mitigating against the proper operation of telegraph apparatus to-day is undoubtedly that due to induction arising from the interaction of high electromotive forces and currents between circuits of the parallel wires of electric railways and those of telegraph systems constructed along a common roadway.

Notwithstanding the great alarm created by this well recognized enemy practically nothing has been done to check its advances; or rather, nothing of a very practical nature has so far been devised to oppose or diminish its power to harm. While there has been much written and said in explanation of how induction is created and as to the manner in which it in turn creates the electrical disturbances in telegraph apparatus, no one seems to come forward with an entirely successful remedy.

With a view of ascertaining just what has been done in this direction the writer made numerous inquiries for a possible solution only to learn that others, with one or two exceptions, were equally uninformed yet fully as anxious as the writer for enlightenment.

The following method, however, is now in practical operation on the Erie Railroad between Rochester and Mt. Morris, N. Y., a distance of forty miles, and is the invention of E. W. Applegate, formerly of the quadruplex department of the Western Union Telegraph Company, New York City, and for which method he has filed papers for a patent.

That the field of his operation is most unfavorable for good results may readily be appreciated by the fact that the inductive influence he seeks to overcome arises from eleven miles of the circuits extending between Avon and Mortimer, which is exposed to the influence of the 60,000 volts' three-phase alternating current generators employed by that road in electrifying their system. This high pressure is reduced by means of transformers to 11,000 volts for the use of trolleys. Mr. Applegate states further that the different phases, being greatly unbalanced most of the time owing to the irregularity of the load carried, the disturbing effects are thereby greatly enhanced. When he arrived on the scene about one year ago all telegraph circuits were metallic, single circuits being unworkable. To-day the metallic arrangement is abandoned, and all circuits are worked single. In regard to the solution of this problem Mr. Applegate states: "After I had experimented along several lines I discovered that if I placed a shunt consisting of a 400-ohm coil of wire in connection with the line, as shown in Fig. A of the accompanying diagrams, the interaction which was set up between the relay

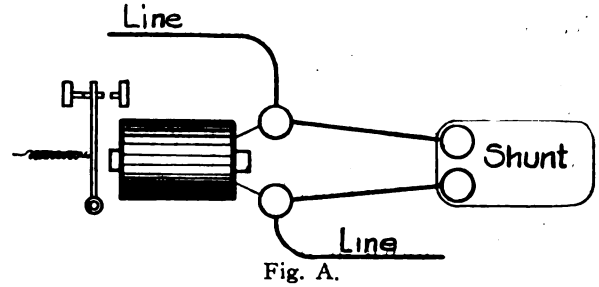

Fig. A.

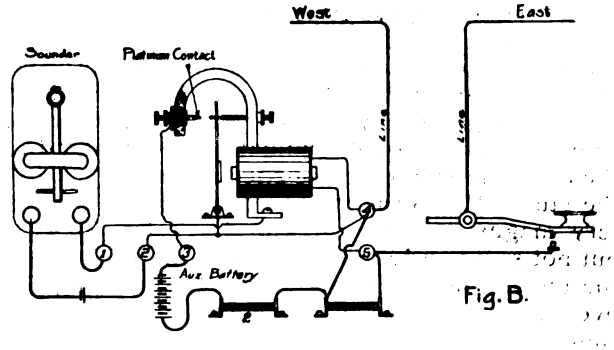

Fig. B.

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coils and the shunt effectually eliminated all the chatter, the latter apparently being absorbed, so to speak, by the shunt. On the other hand, by using a non-inductive resistance shunt, such as a carbon filament lamp or simple rod of carbon, the chatter, although not quite so effectually eliminated, was nevertheless diminished to a practically negligible degree. This slight defect in the carbon shunt may be overlooked in a choice between the two types, because carbon prevents retardation. A few cells of local battery, arranged as shown in Fig. B, at once livens up the instrument and thus compensates for that slight loss the carbon produces.

"Having become fully convinced that the elimination of the static effects from the lines themselves was probably an impossible feat, I turned my sole endeavors toward pacifying the instruments. This I have accomplished by the method shown in Fig. B. By means of this arrangement the instruments are so successfully pacified that they operate as normally as though the wires were clear of extraneous influences.

"I use two carbon rod shunts for each relay connected as shown in the diagram. Shunt 1 is placed in the line between the relay and the key, the latter being outside of the shunt. The resistance of this shunt is determined by its distance from the terminal battery, the nearer the latter to the exposure the better the facility offered for carrying off the static.

"Shunt 2 is connected to the back contact point of the relay and to the main line binding post. When the armature falls back as the line opens this shunt is also connected and co-operates with shunt No. 1 in subduing the vibrations of the lever and thus rendering the armature more easily attracted by the magnet when the line circuit is again closed.

"By regulating the resistance of shunt 1 a portion of the current may be so diverted from the relay that the latter will not become prohibitively sluggish in response to the home key. Where this lagging tendency is too pronounced, however, I find that a seven-volt auxiliary battery placed in the circuit of shunt 2 quite effective in eliminating the fault. When the armature falls back this battery magnetizes the cores of the relay slightly, but not sufficiently to attract the armature against the tension of the retractile spring but enough to override the extraneous influence and at the same time hasten the action of the magnet when the line closes.

"Of course, there are details as to the adjustment of resistance and apparatus which play an important part in the arrangement, which must be looked after closely, but nothing of a nature that requires unusual skill."

Among other methods mentioned in the letters received, as having been tried and proven unsatisfactory, was that of dividing the circuit into three sections, the middle section consisting of that length of the wire which was directly exposed to the inductive influence. The idea entertained was that it would be easier and more economical to pacify the few instruments in a short circuit than it would to pacify the full length of the conductor by a like equipment of many or all stations, and that when this had been accomplished the pacified short length might be repeatered into the unexposed, and consequently unaffected divisions of the circuit each side of it. Unfortunately this arrangement did not meet the expectation. It is stated that the short or exposed length of the wire, under these conditions, immediately absorbed a greater degree of the foreign influence than when the full circuit was intact and derived the benefit of the counter effect produced by many relay coils.

Another stated that the popular notion that the neutralization of inductive effects could only be accomplished by means of properly arranged condensers placed around the relays did not prove to be true so far as his experience went.

The subject is one of interest and is certainly of great importance, and if any of our readers can suggest anything in the nature of a solution of the problem we shall be glad to publish the same.

Recent Telegraph Patents.

A patent, No. 880,971, for an insulator, has been granted to George W. Carter, of Canyonville, Ore. The insulator is transversely grooved to receive a tie wire, which clamps over the line wire and passes through an aperture in the supporting pin of the insulator.

A patent, No. 880,978, for an electrode element for storage batteries, has been issued to Thomas A. Edison, of Orange, N. J. An electrode element, comprising a perforated inclosing pocket non-deformable under normal working conditions, containing a highly compressed mass of active material and a net-work of conducting paths formed of overlapping flakes extending throughout the active mass and in contact with the pocket walls, and with which the particle of active material are deformably compressed into intimate contact, substantially as set forth.

A patent, No. 880,979, for a method of making storage-battery electrodes, has been awarded to Thomas A. Edison, of Orange, N. J. The method of making electrode elements, which consists in introducing a mixture of particles of active material and flake-like conducting material within non-deformable inclosing pockets, and in applying a pressure to such material sufficient to crush or deform the active particles and cause them to substantially follow the contour of the conducting flakes, as and for the purposes set forth.

A patent, No. 881,642, for an electric relay, has been issued to Edward Weston, of Newark, N. J. A pair of electromagnets has an armature pivoted at one end of the poles. A pair of contacts on this armature corresponds with a pair of stationary contacts supported on a bar secured to the base.

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A patent, No. 882,424, for an insulator pin, has been taken out by W. Scharfhausen, of Payette, Idaho. A device for securing an insulator pin within the cross arm of a telegraph pole, comprising a groove which receives a nail and deflects the latter outwardly into the wood of the cross arm. The nail is afterward bent over to hold the pin in place.

The following patent has expired:

Patent No. 447,943, for railway-car telegraphy, held by W. S. Cook and M. C. Cook, of Omaha, Neb.

Personal.

Mr. W. Stanley Eckert, son of William H. Eckert, and a nephew of General Thomas T. Eckert, was married on March 20 to Miss May Davenport Seymour.

Mr. Al H. Babb, previous to a quarter of a century ago one of the brightest stars in the telegraphic firmament, has lately retired from the brokerage business in Peoria, Ill., with which he has been identified for the past fifteen years, and will hereafter make his residence in Chicago.

Mr. Thomas A. Edison, accompanied by his wife, has gone to Florida for a vacation of a month, in order to recuperate from his late illness occasioned by mastoiditis, for which he was obliged to undergo an operation. It is said that all Mr. Edison now requires is rest to restore him to his former health and strength.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

J. C. Barclay, assistant general manager and electrical engineer of the company, is again at his office after an extended western trip, undertaken in the interest of executive business.

Mr. W. W. Umsted, manager of the Omaha, Neb., office, accompanied by his wife, returned on March 18 from a two months' vacation spent in Italy. Both Mr. and Mrs. Umsted were much improved by their trip abroad.

Mr. T. J. Cooper, manager of the Bay City, Mich., office since 1870, was a recent executive office visitor and called during his stay in town on many old friends. Mr. Cooper sailed for Europe on March 25, and will be absent about six weeks.

The Barclay printing telegraph system is being extended to cover circuits between New York and Cincinnati, Cincinnati and Chicago and between Chicago and St. Paul and Chicago and Omaha.

RESIGNATIONS AND APPOINTMENTS.

J. C. Hurst, of Richmond, Ind., has been appointed manager of the office at New Castle, Ind., vice M. B. Adams, deceased March 3.

E. D. Edwards, formerly of Cheyenne, Wyo., has been appointed chief operator at Reno, Nev., vice J. E. Palmer, resigned.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Edward J. Nally, vice-president and general manager, has reached the Pacific Coast in his extensive tour of inspection in the Far West. He will visit the cities of the coast before his return.

Charles C. Adams, second vice-president, is absent on a trip of inspection in the South.

Harvey D. Reynolds, superintendent at Buffalo, N. Y., was a recent visitor.

William Begg, master mechanic, Eastern Division, died at his home in Demarest, N. J., on March 22, after a brief illness. He leaves a widow and five children. Mr. Begg had been in the employ of this company for fourteen years. He was an honest, faithful, hard-working and unusually efficient employee, whose courteous and kindly disposition made him a host of friends and endeared him to all who knew him. He was a Mason and past master of his local lodge.

In addition to the large fine new office soon to be occupied by this company in Pittsburg, mentioned elsewhere in this issue, other new main offices, which will be strictly first-class in every particular, are now in course of preparation at San Francisco, Seattle, Wash., and Augusta, Ga.

Radio-Telegraphy.

William Marconi has been elected to the position of managing director of the Marconi Wireless Telegraph Company, London, England, vice H. Cuthbert Hall, resigned.

A decision of great interest to those concerned with wireless telegraphy and telephony has lately been given by the German patent office. It appears that Professor Ernst Ruhmer some years ago invented an arc interrupter for generating undamped oscillations, corresponding very closely to that used in the Poulson system and to some extent anticipating its use. The priority of Ruhmer's invention has now been recognized and a patent is to be issued for it.

Senator Hale, of Maine, who is chairman of the Senate Committee on Naval Affairs, has introduced a bill in Congress to regulate wireless telegraphy. The bill proposes to license all wireless telegraph stations or vessels equipped with wireless apparatus that do an interstate business. The issuing of the licenses is to be under the control of the Department of Commerce and Labor, and all licensed stations will be obligated to transmit or relay messages from any other licensed station, or from government wireless stations. The main feature of the proposed law, however, is the provision making it an offense for any wireless station to interfere with government messages, and giving the government power to take charge of all wireless telegraph stations in time of war. Penalties are provided for willful interference with government messages or for the unlawful employment of wireless telegraphy.

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Interchange of Business Between the Telegraph Companies and the Wireless Systems.

Walter W. Massie, the inventor of the system of wireless telegraphy bearing his name, in a recent communication to the Electrical World, takes strong ground in opposition to the passage by Congress of the Hale bill, the effect of which would be to confer upon the government a monopoly control of wireless telegraphy. He also takes occasion to arraign the telegraph companies for their attitude assumed in relation to wireless telegraphy. He says:

> The telegraph and cable companies have been very persistent in publicly ignoring wireless telegraphy as a competitor, but a recent circular issued to the managers of all its offices by the Western Union Telegraph Company indicates the real attitude. In this circular it is ordered that all messages offered by the Marconi Company for transmission to points on this side, must be treated as local messages, be dated at Glace Bay, N. S., and be charged for at the local rate.

The circular of which Mr. Massie complains, reads:

> Code addresses cannot be accepted in such messages, which must be fully addressed in accordance with the rules governing the transmission of domestic messages. If the Marconi Company wishes to give any indication of other origin, they must do so in the body of the message. The message must be checked at full commercial rate, whether addressed to a newspaper, individual or firm. Messages addressed to parties on the other side routed via Marconi wireless or Glace Bay, cannot be accepted. We will, however, of course, accept messages addressed to the Marconi Company, or anyone else at Glace Bay, but no other direction or indication can appear in the address. Such messages should be checked at full commercial rates, and the tolls to Glace Bay only collected. We cannot under any circumstances accept the Marconi tolls or anything beyond Glace Bay on these messages, but must treat them solely and wholly as local messages between the point of origin and Glace Bay.

A telegraph official in commenting upon this matter had this to say:

"The criticism Mr. Massie would put upon the telegraph companies for their attitude toward the wireless companies in the matter referred to is manifestly an illogical one, and indicates an evident misconception of the situation. As a matter of fact, the policy of the companies in declining to transfer to the Marconi Company at some intermediate point messages addressed to points on the other side of the Atlantic which the telegraph companies reach by their own lines, is strictly in accord with the well-established practice of the companies on this side in dealing with each other. Those companies, for instance, having their own lines to, say, Chicago, will not accept at New York a message addressed to Chicago marked for transfer to a competing company at Philadelphia in order that the latter may complete the transmission. Their position is that they will accept business for transmission only by their own lines, when destined to places reached by those lines, and they take identically the same position with respect of the Marconi transatlantic service. It is manifestly absurd to expect the telegraph companies on this side to place their thousands of offices and the vast collecting agencies which their systems afford at the disposal of the Marconi Company for the purpose of competing with them in their own field on equal terms.

"So far as the question of abbreviated addresses is concerned, the telegraph companies on this side have never conceded the admissibility of code addresses for domestic messages, but take the ground that there is no occasion for placing upon the companies the burden and upon the service the delay of unpacking code addresses in domestic messages, so long as such addresses are not counted nor charged for. The messages delivered to or accepted from the wireless station at Glace Bay are necessarily treated as local messages destined to or originating at that point, so far as the land transmission is concerned, and they are subject to the same rules and regulations as govern all other messages of the same class.

"As a matter of illustrating the fair and even liberal attitude of the telegraph companies toward the wireless service in general it may be well to call attention to the fact that those companies accept messages freely addressed to vessels at sea, and turn the same over to the wireless stations for transmission, accounting to the wireless companies for their proportionately heavy tolls. They even refund the small amounts accruing to themselves for the land transmission in the very frequent cases where the messages fail in delivery owing to ships being out of wireless range or other defects in the wireless service, notwithstanding that the land service was fully and properly performed, and that they have no interest in the wireless tolls nor any responsibility for the wireless service."

Business Notice.

The "Telegraph Book" is an ingenious device embodying features of such convenience and practical value as to recommend its adoption in business offices. By its use three copies of a telegram are made at one writing—the first is on the regular telegram blank for sending, the second is a carbon copy on thin, tough tissue, and the third is a confirmation blank for mailing. The copy to be retained is bound securely in the book. When the book is filled the contents can be removed and the covers used repeatedly. The Telegram Book is manufactured by the Perry Book and Bindery Company, of Fond du Lac, Wis., and is advertised in the "Directory" on another page of this issue.

In the English House of Commons on February 17, the postmaster-general stated, in reply to a question, that telegraph poles were at present purchased abroad, and were of red fir. Attempts had been made from time to time to obtain supplies of suitable home-grown timber, but hitherto without success. He recently invited tenders from all parts of the country. The result was disappointing, and the only order he had been able to place at present was with a Welsh firm for a small number of larch poles.

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The Railroad.

The office of H. G. Sherman, superintendent of telegraph of the Central Railroad of New Jersey, has been moved from Jersey City, N. J., to New York City.

The headquarters of W. S. Melton, superintendent of telegraph of the Queen and Crescent Route, have been removed from Chattanooga, Tenn., to Lexington, Ky.

The Illinois Central Railroad Company, it is said, has successfully introduced the exclusive use of telephones for train despatching on its line between Kankakee and Chicago.

Frank F. Fowle, formerly engineer of the American Telephone and Telegraph Company, at New York and Chicago, has established himself as a consulting electrical and telephone engineer in the Marquette Building, Chicago. Mr. Fowle has been a frequent attendant at the annual meetings of the Railway Telegraph Superintendents, and the able papers which he has read before that body have always aroused interest. A specialty of his future practice will be the planning of railway telephone systems for any form of special service, including that of simultaneous telephony and telegraphy and multiplex telephony or telegraphy.

The Coming Convention of the Railway Telegraph Superintendents.

Pursuant to the statement published in the March 16 issue, relative to the half-rate transportation which the Richelieu and Ontario Navigation Company had agreed to extend to members of the Railway Telegraph Superintendents, whose convention will meet at Montreal, Que., on June 24, 25, 26 and 27, the figures for such rates between various points on the line, will be as follows: Toronto to Montreal, $5; Kingston to Montreal, $2.75; Montreal to Quebec, $2.25 one way, return $4.25; Quebec to the Saguenay and return, $4.50. Meals and berths will be extra, dinner one dollar, breakfast and supper seventy-five cents each, berths in outside rooms one dollar per night. In order to obtain advantage of these rates members will be required to show certificates of membership when purchasing their tickets. Such certificates may be procured from P. W. Drew, secretary of the association, whose address is care of the Wisconsin Central Railway Company, now at Chicago instead of at Milwaukee, as formerly.

The programme for the social entertainment of the superintendents bids fair to be a most attractive one. As thus far arranged it includes, as already published, a local trolley ride, an excursion due to the courtesy of the Canadian Pacific Railway from Montreal to Quebec and return, and side trips by water from Montreal, including that to the celebrated Saguenay River, at half rates, as stated. Then an excursion will be made by the Grand Trunk Railway, which will convey members from Montreal to Lachine, where they will board a steamer and shoot the Lachine Rapids. Besides this a special electric train will be placed at the disposal of the association for a trip from Quebec to St. Anne de Beaupre (a celebrated shrine), and which, on its return, will stop at the beautiful Montmorency Falls.

The committee of arrangements, which has control of all matters pertaining to the entertainment of the visiting superintendents, is composed of the following: W. J. Camp, electrical engineer, Canadian Pacific Railroad's Telegraph, Montreal, chairman; W. W. Ashald, superintendent of telegraph, Grand Trunk Railway, Montreal; E. H. Millington, superintendent of telegraph, Michigan Central Railway, Detroit; G. C. Kinsman, superintendent of telegraph, Wabash Railway, Decatur, Ill.; M. Magiff, superintendent of telegraph, Central Vermont Railway, St. Albans, Vt.; S. A. D. Forristall, superintendent of telegraph, Boston and Maine Railway, Boston, and N. E. Smith, superintendent of telegraph, New York, New Haven and Hartford Railway, New Haven, Conn.

The Windsor Hotel, which has been selected as headquarters, and which is conducted on the European plan, will make the following charges: Single room without bath, $2; with bath, $2.50; two occupying a room, without bath, $3; with bath, $4. Meals a la carte. No charge will be made for exhibits if located in the rooms of the exhibitors.

The ladies' committee, which is now arranging for the reception and special entertainment of the visiting party, is made up as follows: Mrs. W. J. Camp, chairman; Mrs. James Kent, Mrs. W. W. Ashald, Mrs. M. Magiff, Mrs. J. F. Richardson, Miss Amy Jennings, Mrs. Thomas Rodger and Miss Gladys Camp.

Intending exhibitors of apparatus of whatever nature at the convention are advised that by authority of the Canadian collector of customs all such exhibits will have to be covered by regular invoices and entry passed in the usual manner, but the duty, if collected, will be refunded on the apparatus being returned to the United States. All those bringing in such apparatus should provide themselves with invoices in triplicate, and also, before leaving the United States, should make a declaration to the United States customs that the instruments are to be returned there, in order that they will not have to pay duty to the United States customs on re-entry. Duty will have to be paid on any souvenirs intended for distribution at the convention.

On the occasion of the meeting of the Superintendents of Telegraph, it is expected that the mayor of Montreal will deliver an address of welcome.

The papers to be read at the convention embrace the following:

"Dry Batteries on Telegraph Wires," by U. J. Fry, of Milwaukee; "Reduction of Telegraphing by Use of Printed Forms," by O. C. Greene, of St. Paul; "Commercial Reports," by G. C. Kinsman, of Decatur, Ill.; "Wiring of Station Build-

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ings from the Contractor's Standpoint," by J. H. Jacoby; "Adverse Railroad Legislation," by E. A. Chenery, of St. Louis; "My Experiences While in Charge of Telegraph Work on the Isthmus," by C. F. Annett, of New Haven, Conn.; "Qualifying Operators for Train Despatching," by C. S. Rhoads, of Indianapolis; "Selecting Operators for Railroad Use," by L. H. Korty, of Omaha; "Moving Trains by Visible Signals," by L. B. Foley, of New York; "Block Signals," by H. C. Hope, of St. Paul; "Use of Telephones in Connection with Train Movements," by W. W. Ryder, of Chicago; "The Interstate Commerce Commission," by Charles Selden, of Baltimore; "Past, Present and Future of the Association of Railway Telegraph Superintendents," by W. F. Williams, of Portsmouth, Va.; "The Telephone," by F. F. Fowle, of Chicago.

The Hulit Selector.

A reliable and efficient means of establishing quick communication with some one particular station has been a question of great importance to the railroad and telegraph companies, who maintain a large number of small offices where the duties of the operator are varied and frequently require his attention to some other part of the station where it is impossible for him to hear a call on a sounder; consequently important business is frequently delayed on this account.

The Hulit selector call provides a quick and reliable means of notifying the operator that he is wanted at his telegraph key or telephone immediately. The selectors are operated by a series of code signals arranged in such a manner that the regular Morse business passing over the line will not effect them, thereby making a false signal impossible. Each selector has its own code number, so that if several offices are called in quick succession there is absolutely no interference, the main line is occupied just long enough for the signal to reach its respective selector which automatically cuts in a bell or any other signaling device on a local circuit, the operation of which is established by current from the local battery and at the same time leaving the main line entirely free. A vibrating bell located in a convenient place continues to ring until the operator responds and by turning a small switch contained in the selector, restores it to its normal condition at the same time answers back to its sending office notifying that the call has been received. The number of the selector, or "O. K.," can be repeated, thus making it absolutely sure that the call had been received.

The efficiency and reliability of a selector call system depends very largely upon the quick and accurate manner in which the calls are transmitted. The ordinary Morse key can be employed for this purpose, but it is slow and in a manner unreliable for the reason that it is necessary to transmit signals to the selector accurately to positively insure their operation, otherwise there would be a possibility of the selector being operated by some foreign signal which would cause considerable trouble and annoyance, making the service unreliable.

The transmitter designed for this purpose is so arranged that any number of selectors up to fifty can be operated. To facilitate rapid sending of calls the names as well as the numbers of all the offices equipped with selectors appear in plain view on the dial of the transmitter and anyone of them can be located at a glance. If, for example, communication is desired with "No. 422 Jones," the pointer is turned to this number, at the same time the hook located at the right-hand top of the transmitter is pulled down as far as it will go and released. No further attention is necessary until "answer back" signal is received. If occasion demands the calling of several offices, the calls can be transmitted in quick succession without interfering one with the other. The uniform manner in which these signals are transmitted makes the operation of the Hulit call system absolutely sure and reliable. In cases where the use of selectors are limited to a small number which would not warrant the use of a multiple transmitter, a single transmitter is furnished for each selector, the operation of which is equally as efficient as the multiple transmitter. The employment of the multiple transmitter is intended where there are ten to fifty selectors in service which would make the use of a single transmitter impractical on account of the large space they would occupy. Cuts illustrating the Hulit selector are shown in the advertising announcement of the device appearing on another page of this issue.

Foote, Pierson and Company, of 160-162 Duane street, New York, are the manufacturers of the Hulit selector.

The Yetman Typewriter-Transmitter Company.

Telegraph operators will be glad to know that the Yetman Typewriter-Transmitter Company, so long manufactured at Illion, N. Y., is now occupying its recently acquired property at North Adams, Mass., at which point it is successfully producing its well-known transmitting instrument. The present plant, which is under a fine organization, is an extensive one, thoroughly equipped in every detail to meet all requirements of manufacture, enabling the company to fill all orders promptly, whether for new instruments or the repair of old, no matter how urgent may be the demand. Mr. Charles E. Yetman, the inventor of the machine which bears his name, and who is the vice-president and general manager of the company, is devoting his energies to the manufacturing end of the business, a fact which means that the products of the concern will be even more than ever jealously guarded in their nicety and efficiency of construction.

D. L. Graham, of Canal Dover, O., writes: "It is a pleasures for me to renew my subscription for Telegraph Age. I shall appreciate your kindness if at anytime my subscription should expire, if you will notify me of the fact, as I am determined to keep abreast of the times."

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Sir Wm. H. Preece on the Telegraph in America.

Sir William Henry Preece, K. C. B., F. R. S., of London, past president of the Institution of Electrical Engineers, for many years at the head of the British Telegraphs, in a lecture on "America Revisited, 1907," recently delivered before that body, said in part, in his reference to the subject of telegraphy in this country: [It should be said in explanation that Sir William stated that he had made four visits to the United States—in 1877, 1884, 1893 and 1907.]

My report of 1877 was almost exclusively on telegraphy.

The progress in telegraphy at each period of my visits is shown by the following table:

	1877.	1884.	1893.	1907.
Mileage of wire	300,000	433,726	769,201	1,321,199
Offices open ..	11,660	13,600	21,078	24,760
Messages	28,500,000	40,000,000	66,591,856	148,804,000
Capital .....$	60,500,000	$80,000,000	$123,000,000	$140,000,000
Income	.....	.....	$24,978,440	$32,856,496

The chief result of the first visit was to establish sound reading, and to introduce quadruplex working in the post office system.

In 1884 the only novelty was Delany's "Multiplex," sending six messages simultaneously on one wire, which we imported and introduced into the post system.

The Western Union Telegraph Company had adopted the British Wheatstone system, and I saw circuits working very well from New York and from Chicago to New Orleans.

The active warlike competition of 1877 and 1884 had ceased in 1893. There was no war of rates. The only form of rivalry was good service. Very great improvement in construction was visible, and underground work became prominent. In Great Britain we had started in 1887 with underground wires, and have maintained that system on a large scale ever since. The Americans, on the contrary, were forced most unwillingly to place their wires underground by fierce legislative enactments, but they have now found that they were wrong in opposing it so strenuously. Their cities were made hideous by several rival lines of poles streaming down their principal thoroughfares. It was much better in 1893. There was no telegraphic improvement of any note. Duplex and quadruplex working were in full swing. But the typewriter for received messages had become quite fashionable. Operators provided themselves with machines, and the telegrams were delivered printed in bold Roman type—a great improvement on the usual hasty scrawl.

There is one condition of business in the United States that makes telegraphy there more profitable than in the United Kingdom. It is the existence in the message supply of what we should now call a good "message load-factor." In the United Kingdom we have but one uniform Greenwich time. People deal with their letters everywhere about the same time. There is a peak of telegrams in the morning, and another, a smaller one, in the afternoon. But in the great breadth of the United States, where there is a difference of time between New York and San Francisco of three hours, the stream of messages is virtually continuous. We may say that the load factor in the United Kingdom is 2, and in the United States 6. Their great distances and belated mails make telegraphy more necessary and instantaneous communication of less consequence. The result is that these circuits carry, on the average, three times as many messages in a day's work.

In 1907 the system of Wheatstone automatic working has been greatly improved practically by Mr. Barclay, the assistant general manager of the Western Union Telegraph Company, impressing the typewriting machine upon both the sending and the receiving ends. An ordinary typewriter typing a message actuates electrically a punching machine, which punches a paper tape in the ordinary way. This punched strip sends dots and dashes into the line in the usual Wheatstone way, so that the conductor is transmitting currents on the Wheatstone system. The receiving instrument is actuated by these currents, and reels out bold Roman type printed on the usual received copy forms, which is delivered to the public. It does this at the rate of 100 words per minute, and while I was in New York one circuit to Boston cleared off 1,097 messages in nine hours. This system has been adopted by the Western Union Telegraph Company in preference to the Buckingham or the Murray.

There were the following Barclay circuits at work at New York:

Chicago	6
Boston	2
Philadelphia	2
Buffalo	1
St. Louis	1

Pittsburg and Atlanta were about to be added.

In this system the operator does not require to know the Morse alphabet nor the manipulation of a key. She needs only to be a typewriter. The instrument does the rest. It requires little work, and it solves the much vexed question of skilled labor. It has reduced the cost of working such circuits by one-half, and it turns out perfect senders in a fraction of the time required to form a skilled Morse operator. The system is extending very fast. The Western Union company is rapidly installing it on all trunk lines, and if I ever visit America again I shall probably find it the most popular service. It is very accurate. On a Chicago circuit eight hundred messages were sent with only two repetitions.

I also inspected the Rowland system, which is on trial on the Postal telegraph system between New York and Boston. It is a quick automatic printing system dependent on the synchronous movement of the apparatus at each end. It works octoplex—four operators at each end having in succession the use of the single wire for a fraction of a second, at rapidly recurring intervals on Mayer's system. It utilizes alternating cur-

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rents. I was not so much impressed with this system as with the Barclay. It is more complicated and dearer to work. It is a mistake to imagine that speed of working is a great desideratum in telegraphy. I commenced my telegraphic career in 1852 with Bain's chemical recording system, which attained a speed of 1,500 words a minute. The determining practical speed is in the handling of messages as they come in. A speaker should not speak at a rate of more than one hundred words per minute. Messages rarely pour in at greater speed than this. It is found in practice that such a speed keeps down the work on each circuit, so that it can be manipulated practically at the highest speed and the lowest cost. If the messages pour in at a greater pace than this then another circuit is necessary. Thus the unit of a telegraphic system is a message, and it is the number of messages per hour and the number of working hours per day (the message factor) that determine the number of circuits per trunk line.

The growth of telegraphy has everywhere been checked by the growth of telephony, but the expenses have not changed in the same direction. On the contrary, they have increased. The combined companies in the States have found it necessary to revise and increase their rates. The average increase adopted has been only two per cent., but many anomalies have had to be regulated, and increments of from thirty to sixty-six per cent. were made. It is remarkable how quietly this was received. It was a pure business transaction, and the Americans are essentially business people. One cause of the greater cost was, however, the reduced working capacity of the human operator, who, in my first visit, averaged twenty-five messages per hour; now the average is only seventeen. Hence the commercial value of mechanical systems worked on the automatic principle.

Our old friend, Mr. Delany, has designed an "autodot transmitter," which reduces the difficulty of learning to work the Morse key. It has two levers, one for dots worked by the thumb and one for dashes worked by the forefinger, moving horizontally with very light pressure. The number of dots made depends on the period of pressure. Thus any one with a musical ear can work a Morse key without any fatigue and with much greater accuracy. It is not so dependent on skill, and its use tends to cheapen operating charges.

He has introduced also an automatic system in which he has utilized the static charge. His receiver is the Bain chemical recorder. He has also introduced a secret system which prevents tapping or overhearing. The autodot key is used. It is very ingenious. The impulses set up by the key are sifted or disintegrated by a relay at the receiving end, which will respond only to its own tuned key.

An Appreciated Expression of Approval.

Francis W. Jones, formerly and for over twenty years the electrical engineer of the Postal Telegraph-Cable Company, New York, a telegrapher of profound knowledge in the technique of the art, and a gentleman of widely extended acquaintance both in the profession and out of it, took occasion the other day when renewing his subscription to Telegraph Age, to write concerning the paper as follows:

"As one of your earliest and continuous subscribers I desire to attest my satisfaction with the contents of Telegraph Age by requesting the renewal of my subscription for another year. Telegraph Age has provided abundant information of the very latest and best character for the guidance of both officials and operators in the most successful and profitable operation of telegraph wires and the exceedingly delicate electrical apparatus employed in testing and in the transmission of telegrams. The personal columns have also proved interesting to those in the service, in maintaining a sort of family acquaintance and history. The valuable technical instruction Telegraph Age has placed in the hands of practical telegraphers has assuredly resulted in a greatly increased efficiency of the carrying capacity of telegraph circuits, and for this I believe the telegraph companies are your debtors, as well as telegraph employes whose promotion is dependent upon the acquisition of knowledge pertinent to their profession."

The Cable.

The Republic of Chile has notified its adhesion to the International Telegraph Convention.

George Gray Ward, vice-president and general manager of the Commercial Cable Company, New York, accompanied by his wife, will start April 15, for Europe, going to Lisbon, Portugal, where he will attend as a delegate the International Telegraph Conference, the opening date of which is set for May 4.

The length of the cables laid by the Eastern and South African Telegraph Company between Mozambique and Durban direct is 1,186.45 nautical miles; between Mozambique and Quelimane, 423 nautical miles; between Quelimane and Beira, 260.5 nautical miles, and between Beira and Lorenzo Marqués, 584.5 nautical miles.

Cable communication is interrupted March 28, with:

Venezuela	Jan. 12, 1906
Hayti	Jan. 18, 1908
All offices closed to international traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.	
Madura Island (Dutch East Indies)	Feb. 3, 1908
Sitka-Valdez cable interrupted	Mar. 21, 1908

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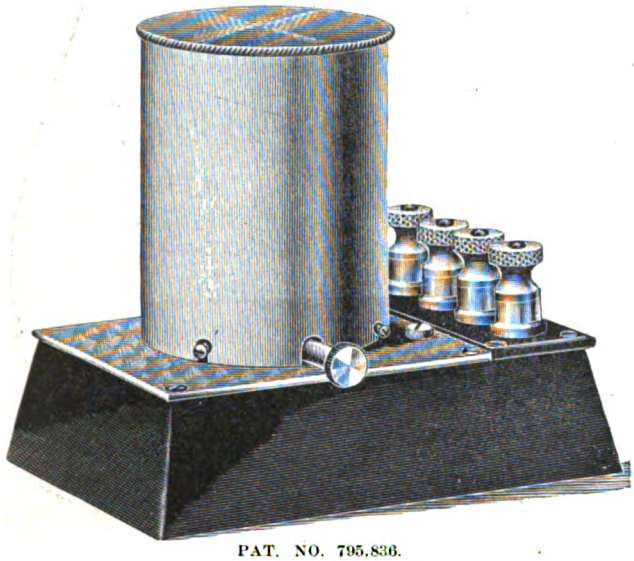
THE HULIT SELECTOR



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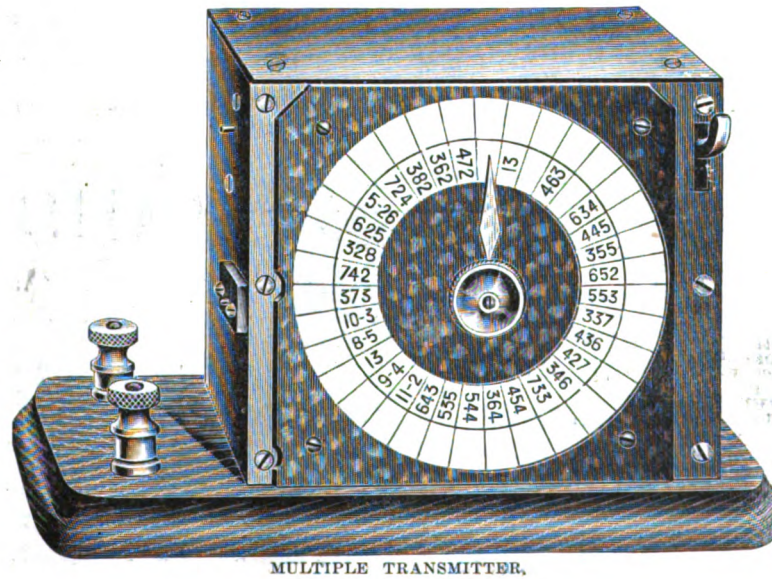
Greatly simplifies and increases the efficiency and rapid transmitting of calls. Set the pointer at the number of station to be called, pull the hook down; no further attention is necessary. Transmitter is arranged for any number of selectors up to fifty. Different calls can be sent in succession without interfering.



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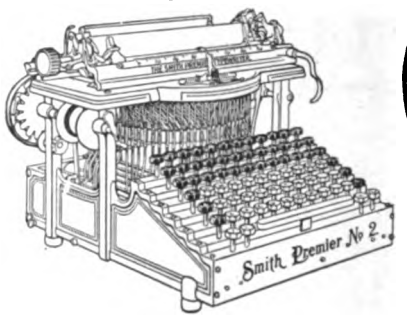

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NEW YORK, APRIL 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Questions Before the Railway Telegraph Superintendents.

The next meeting of the Railway Telegraph Superintendents, to be held at Montreal in June next, promises to be one of unusual interest. This is accounted for in part by the important new problems which have lately arisen in this country in connection with the operation of the nine-hour law, one of which is the substitution in larger measure than ever before of the telephone for the telegraph in train despatching. This and others considered in their various aspects as collateral thereto, are likely to furnish material for earnest discussion by the superintendents, and will doubtless prove sufficiently momentous to assure a large attendance.

Well may the introduction of these new phases in railroad operation come up for serious consideration at this time, for the far-reaching requirements of the nine-hour law are such as to work changes that may be regarded as approaching the revolutionary in character in the telegraph business so far as the handling of train orders by telegraph is concerned. The significance of this fact is doubtless fully recognized by the superintendents. The operation of this new governmental law must also as a natural sequence very materially promote the adoption of the block signal system on all railroads, and we may expect to see the signal tower usurp in part the place of the station telegraph office. Another retrenchment in telegraph usage for which the nine-hour law must also be regarded as responsible, is the fact that the railroad companies are despatching by train mail a large and growing percentage of the messages that formerly were transmitted over the wires. The discussion of these topics in all of their important bearings will serve to arouse much interest.

The Telegraph Situation.

It is a well-known fact that there are many commercial telegraphers in this country at this time who are without employment. Not only is this true, and to an extent never before realized in the history of the telegraph, but a large additional number who, while ostensibly engaged at the key, are, as a matter of fact, working on part time only; and everywhere we hear of the scaling down of wages. These facts are significant and indicate a deep-rooted cause of trouble. They reflect a condition in the telegraph service without precedent, one that cannot be attributed as being wholly incidental to the ordinary influences of business depression. In truth, it is quite out of the ordinary, and its existence may well cause questioning and reflection as to its origin and its ultimate effects.

Notwithstanding that the telephone has in late years proved to be such a formidable competitor with the telegraph, cutting sharply into its short-distance business, the telegraph companies were still handling an enormous volume of business when about a year ago this time they saw their way clear to voluntarily raise the wage schedule of their employees ten per cent. Instead of welcoming this measure as a distinctive financial gain made in recognition of the needs of the operating forces, as a manifestation of good will; an act, if not attributable perhaps to motives of benevolence, then at least to pacification, the influence of this tender, surprising as it may seem, appeared rather to arouse than soothe the antagonistic and incendiary natures latent in the dissatisfied element in telegraph employ. Although at first acknowledged and accepted, the repudiation of the pact affirmed in this wage increase soon followed, and the notable strike of last year took place. That occurrence and the dismal failure attending the same are now matters of history. But the strike in effect exerted a vicious and demoralizing influence, first to those engaged therein and then reflexly upon the telegraph itself. Its deadly venom struck deep into the individual welfare of those concerned therein. All such are now mostly out of employment. Its

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poison has also been felt in the effect it has exerted on the prosperity of the telegraph companies themselves. For the union organization, although badly discredited by failure, both during the strike and since, has sought to heap opprobrium on the telegraph and bring about its injury by the attempted creation of legislative enactment hostile to its interests. Because of the mendacity of utterance on the part of leaders of the organization, coupled with adverse influences exerted by the financial panic so soon following the strike, hardships have undoubtedly beset the pathway of the telegraph companies in a manner and to an extent hitherto unknown in its history. The disastrous consequences have also been felt, unfortunately, in the loyal ranks of the personnel, expressed by a forced depletion in numbers and by cut salaries, for it has been found necessary to reduce expenses in telegraph management to a minimum. Sufferers there are, innocent victims of strike influences, harmful effects to which must be directly charged a majority of the ills that now embarrass telegraph interests.

It would be interesting to know to what extent the public is now employing the mails instead of the telegraph as formerly. Users of the telegraph were asked to believe that it was a practice of the companies to forward messages frequently by post rather than by wire. While charges of this nature were infamous, as their originators very well knew (the resort of the companies to the use of the mail and more often to the services of special messengers to deliver their messages in times of emergency, whether due to broken wires or crippled messenger service or other untoward disaster), the result is shown, unfortunately, in the fact that it is more easy to impair credit than to build it up. To restore business to its old accustomed channels when once diverted therefrom requires time and patience, the disproof of false accusation and the return of confidence.

To apply the old familiar phrase, the striking element has "killed the goose that laid the golden egg," and in consequence there is distress and lamentation in the land. They have placed telegraphic employing interests in such a position as to effectually bar their own return to their former places. In plain English, there is no work at the present time for them to do, and the times will have to improve very materially during the coming summer to give employment to one-half of the operators who may be idle. The remainder must wait their opportunities or seek employment in other walks of life.

We hear it said that the railroad companies have need of many additional operators because of the enforcement of the nine-hour law. But not many commercial operators have been taken under the wing of the railroads. The railroads themselves have felt the pinch of the hard times, and are meeting nine-hour requirements not by taking on new men, but by closing many telegraph offices and shifting their forces in such a manner as to obviate the necessity of employing additional telegraphic help.

Sympathy may be felt for the great body of unemployed telegraph operators, yet it cannot be forgotten that they brought disaster upon themselves, and in so doing are largely responsible for the dullness that has seized upon the telegraph business, and distinctly so for the distressing conditions now more or less affecting the entire personnel embraced in the telegraph fraternity. In the nature of things, especially in a country like this, so charged with recuperative power, times are bound to improve and the telegraph will get back again to normal conditions and have need of many additional operators, but the time is not yet nor is it likely to be during this year of our Lord, 1908. In the meantime unpropitious conditions affecting employers and employe alike must be endured, met and overcome as best they may.

The Supreme Court of Michigan has rendered a decision that the rules of the telegraph companies as printed on the backs of their sending blanks to the effect that the company is not to be held liable for delays in delivery or for non-delivery of any unrepeated message is not binding. This has always been held in previous decisions to be binding on senders of messages in that state. The court was evenly divided on the subject.

A bill was introduced in the New York state legislature on March 20 amending the Public Service Commission act in many respects and particularly to give the commission power over telephone and telegraph companies. The bill was approved by the governor before its introduction.

The publisher of Telegraph Age urges upon subscribers to this journal the desirability of having the paper sent to their home address rather than to their place of business. The reason is obvious. If it goes to your home it reaches you without danger of obstruction or abstraction by your office associates who are sometimes prone to borrow your copy to your discomfiture and their edification, but at your expense. This naturally is a source of irritation and of course you don't like it. If a man wants Telegraph Age he should pay for it, and the individual who is paying for his copy should be guaranteed in his rights.

As we regard our subscribers as our friends, and believe we are supplying them with a telegraph paper the like of which does not elsewhere exist, we dislike to see them disappointed, and wish to protect them in their prerogative so far as we are able. We believe that a good many disappointments of non-receipt of the paper might be averted if our suggestion of sending it in all cases to the homes of its subscribers were adopted. Changes of address will be made as often as desired.

If you wish to know all about the instruments you work, invest $1.50 in a copy of Jones' diagrams.

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A Chapter of Reminiscence.

BY DR. L. M. RHEEM, OF MINNEAPOLIS.

I have just finished reading Telegraph Age of March 1. And I want to say that when I read the Age, I read it as it should be read; I begin at the top of the first outside page of the cover and continue reading to the bottom of the last page of said cover, and when I get through I feel that I have read something that is worth putting some time on. But while I enjoy the exercise of the reading, I occasionally see some things that need either explanation, elucidation or further elaboration, before they can be safely offered for the consumption of the rising generation.

For instance, in this particular issue, I find in Brother James H. Gormley's delightful reminiscences, two statements that need a little treatment. Brother Gormley says: "Old men, you know, like to revert to the past, for it is an atmosphere in which they dwell more frequently than that of later day events." And, again: "If I have unconsciously made any errors of statement, attribute it to a possibly faulty memory."

Now, let those two statements alone, and the first thing you know there will be wandering around over the country, likely to go off and hurt some one, a double-barreled syllogism about like this: "Old men reminiss; old men have faulty memories; therefore, any man who reminisces is an old man and has a faulty memory."

How would that affect some of us boys, who, at the beginning of a glorious, glittering and useful career, pause long enough to tell about something that happened fifty or sixty years ago? Wouldn't it be "Back to the woods, grandpa!" for us?

I have had the honor of a place in the reminiscential family of the Age, and it made me feel good for two reasons; first, because I realized that I had broken into good company, and, second, because my reminiscences were the first and only things written by me that got themselves published. Of course, I know that I have tossed off a number of gems that should have been published had they not fallen into the hands of too hypercritical editors, for they were certainly good enough to print. Having gotten this far on the road to fame, I do not propose to run the risk of being passed outside on account of any seniliferous tendencies poorly established by an unborn syllogism, without declaring myself.

My declaration is that I am not old, and that my memory instead of deteriorating is getting stronger and better every minute. Why, do you know that when I sit down, throw on the reverse lever and gently glide back through the evergreen aisles of the (to some persons misty) past, I can recollect things that never happened, and can cite dates, persons present, and who I can prove it by. If that is not going some in a memorical way, I am not a judge.

I was thinking that just thirty-two years ago about now, I went to Denver to take the position of manager of the Atlantic and Pacific telegraph office; and I also remembered that I had promised you to send you some reminiscences of that time and place. It may be a trifle lengthy and some prolix, but I guess you have a blue pencil for censoring and a good pair of shears to chop it into suitable doses.

At just about this time of the year I had finished changing the Atlantic and Pacific Omaha office from a zoological exhibit into a sure enough telegraph office, increasing the receipts from a net nothing to from $3.31 to $7.85 per month. Mr. J. J. Dickey, my superintendent, noticing my skill in revivifying apparently hopeless propositions, asked me to go to Denver as manager to see what could be done in the way of increase there. I went.

On my way out I stopped at Cheyenne to confer with C. F. Annett, who had a sort of supervisory relation to the line between Cheyenne and Denver, and a fatherly interest in the Denver office. I will always remember the way in which Mr. Annett entertained me in Cheyenne, and showed me the town, with which he seemed to be well acquainted, and also the many helps he gave me while I stayed in that part of the country. I have never had a chance to repay him but hope to have some time.

I relieved Mr. C. F. Bouton as manager at Denver, he leaving the telegraph service for assaying in the mines in the Saguache mountains. Mr. Bouton introduced me to the patrons of the company and left the next morning for his new work.

Our office was on Holliday street in one corner of a commission house. The force I presided over there was as good a one as I ever saw in any place. As I remember it, it consisted of myself as day chief, myself as wire chief, myself as traffic chief, myself as night chief, myself as bookkeeper and cashier, and myself as manager. The operator on the Denver-Cheyenne wire was myself. I forget who worked the other wires, but since I come to think it over, I believe that was the only wire we had.

The star of the office, however, was the messenger boy, George Muirson; and I want to say right here that in all my experience with messenger boys, he was the king of them all. He was a Scotch boy about thirteen years old, but had the knowledge of a man. George's great ambition in life was to make that office pay and close up the Western Union for good; he was continually scheming to that end. In fact, everybody connected with the opposition telegraph business had to scheme to make things go and hold their job, at the time I speak of.

The business of the office was very light; the receipts scarcely more than paying expenses. In looking back to those times, and considering the policy of the company in relation to the location of offices, I often wonder why it was that we did any business at all; the office was usually located

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in one corner of a tailor shop, on a shelf in the front window of a cigar store, in a commission house, or in a part of a drug store for which the ingenuity of the druggist could find no use.

Once in a while a man would make up his mind that he would "patronize the opposition, for the reason that by so doing he would assist in reducing telegraph tolls to such a surprising extent that people would soon cease writing letters and the United States mail would be a thing of the past." When he arrived at the office he usually had to either talk to the tailor awhile about getting a suit of clothes, shake the dice for the cigars with the proprietor of the store, eat a handful or two of prunes, or go into the back room to help the druggist move a stove, before his mind was in a condition for pressing his message into a ten-word bale; and on account of this diffusion of attention the man generally forgot what he came in for and went home and wrote a letter. It is almost impossible at this distance to figure the loss to the telegraph company from this source, but as near as I can figure it I am sure that it would approximate several million dollars; but, of course, it might be less.

At the time I speak of, there was a stock exchange in Denver whose dealings were confined to the few local stocks, and the stocks listed on the San Francisco stock exchange. Our company furnished the San Francisco list to this association; we got the list each day about two o'clock from San Francisco direct. The arrangement was that we were to deliver the list to the exchange where it was posted; no individual member of the exchange was to see it before such posting. Trades were then made and settled on the list of the next day. For this service we received $15 per month.

Some of the brokers had a great anxiety to see the list previous to its posting, and approached some of the members of my force, with the object of making an arrangement by which they could do so; but on account of the sterling honesty of each member of the force, they did not succeed in their plans. To this day, when I think of how that force stood up under the blandishments and accompanying refreshments handed out by those brokers, a spasm of pride passes over me, like the rustling of a winter's wind through the dead leaves on a bunch of jack oaks.

When the blandishments and refreshments came to my knowledge, they set me to thinking; the result was that I suggested to one of these importunate gentlemen, in a delicate and diplomatic way, that while I could not show him the list, such a thing as a private message daily, by which he could get either the full list or the active stocks, might be arranged. The suggestion seemed to strike him favorably, and it was arranged with Mr. Bloomer, our manager at San Francisco, to send the broker a message each day, under an assumed name. The message was to be delivered in a way that would ensure perfect secrecy, and no receipt was to be taken for it; this was somewhat at variance with the rules of the company, but in my judgment they needed the money more than they did the rules. The scheme worked fine; and as the tariff to San Francisco was $2.50 and 17, it increased the receipts.

In a short time through working this suggestion judiciously, we had several customers on this basis, and the office was certainly on Easy Street so far as receipts was concerned.

(To be continued.)

Charles Bright on the Cable Service.

In a recent communication by Charles Bright, F. R. S. E., in the London Times Engineering Supplement, that writer essays to impart information respecting cable transmission in a manner which illustrates his unfamiliarity with a proper understanding of the subject he attempts to discuss. He says:

> The fact is that the great submarine cable systems are far more efficient than telegraphy over comparatively short distances by land. Thus, though New York is some 4,000 miles from London, cablegrams are transmitted there, and an answer secured, in far less time than it usually takes to get a telegram between London and Liverpool. Transatlantic cablegrams are, indeed, transmitted direct into stockbrokers' offices at London and New York quite ordinarily within a minute; and about five minutes is, as a rule, sufficient to cover a complete buying and selling operation between the London Stock Exchange and Wall Street, New York. For this pitch of perfection we have, in the first place, to thank healthy rivalry between four competing companies.

The so-called rivalry referred to by Mr. Bright as existing between four cable companies in transmitting messages between the London Stock Exchange and that at New York, has as a matter of fact only an indirect bearing on the splendid service rendered. The quick telegraphic results he cites are reached rather because of the methods adopted of instantaneous delivery and not so much because of rival competition. This is demonstrated by the fact that on receipt of a message from the London exchange the clerk at the cable counter in the New York Stock Exchange calls the customer addressed to the desk and delivers to him personally the telegram. The information communicated can thus be immediately acted upon and the reply promptly cabled without any person concerned in the transaction leaving the building. The elimination of all unnecessary detail in the handling of the message, rendered possible by the circumstances of the case, is responsible for the exceedingly efficient prevailing cable service effecting stock exchange transactions, that appears marvelous to the lay mind and which is indeed a record of energy almost without parallel.

On the other hand, however, should a cablegram be received from London for delivery, say, at a point in the upper portion of the city, relatively the same as in the case of a message sent from London to Liverpool, referred to by Mr. Bright, the result would be different. The cable office after translating the single word standing for the addressee into, let us say, John Smith, 6000 West One Hundred and Twenty-fifth street,

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New York, would forward the message to the main office of the telegraph company whence it would be dispatched to the branch office nearest to the number given, and which possibly might be located a half mile or more distant therefrom. This interval must be overcome by the more or less alert services of a messenger boy. Time has been unavoidably consumed in this endeavor to reach the party to whom the message is addressed, although expedition has been practiced. Now, let us suppose that when the cablegram finally reaches its destination the one for whom it is intended is not at his office—possibly has gone downtown, five or ten miles away, to meet a business engagement, a contingency that of course happens in Liverpool or any other large point, whether in England or elsewhere. Hours later, perhaps, a cablegram in answer is filed for transmission to the anxiously waiting party in London, who cannot understand why his message should not have received immediate reply. The telegraph and cable have done their work well, but the irate Londoner has nothing but abuse for what he calls slow service. It is a matter of regret that writers like Charles Bright, F.R.S.E., can be found who do not make these points clear to the public mind.

Representative Canadian Telegraphers.

SIDNEY B. McMICHAEL.

Sidney B. McMichael, of Toronto, who holds the position of general assistant of the Great

SIDNEY B. McMICHAEL.
General Assistant Great North Western Telegraph Company, Toronto, Ont.

North Western Telegraph Company, and superintendent of the Dominion Messenger and Signal Company, is a native of St. Louis, Mo., where he was born September 17, 1873. He is the son of Isaac McMichael, vice-president and general manager of the Great North Western Telegraph Company, who is a native Canadian. He entered the telegraph service at St. Paul, Minn., October 1, 1892, in the employ of the Western Union Telegraph Company. During 1893, '94 and '95 Mr. McMichael was engaged in other business, but in 1896 returned to the telegraph at St. Paul, and for nearly three years served as cashier of the Western Union interests at that point. After another brief absence from the telegraph service, he was appointed in 1900 general superintendent of the several American district telegraph companies, covering the districts embraced within the states of Minnesota, Wisconsin, the Dakotas, Montana and Washington, subsequently, in 1902, receiving the appointment of assistant superintendent of the American District Telegraph Company of New Jersey, of the eighth district, Western division. After serving during 1904 and 1905 as secretary and sales manager of the American Locomotive Equipment Company, at Chicago, he accepted in 1906 the position he now fills.

JOSEPH BEAUCHAMP.

Joseph Beauchamp, inspector of the Quebec division of the Great North Western Telegraph Company, at Quebec, Dominion of Canada, is a representative type of the best element in the

JOSEPH BEAUCHAMP.
Inspector, Great North Western Telegraph Company, Quebec, Que.

Canadian telegraph field. He was born at Montreal, Que., April 7, 1873, and began his telegraphic career August 14, 1887, when but a lad, beginning as a check boy in his native city in the employ of his present company. In fact, in this particular service he has always remained. Readily acquiring the ability to telegraph, he became an operator, thus serving until 1890, when he was transferred to the Campbellton, N. B., office. After two years he was promoted to the managership, a position he retained until 1905, filling the post with much ability, when, on November 1 of that year, he received appointment to the position he now holds.

Mr. C. L. Lewis, superintendent, Postal Telegraph-Cable Company, Los Angeles, Cal., in a recent letter writes in a pleasant vein and remarks: "It gives me pleasure to renew my subscription and to wish Telegraph Age renewed success."

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The New Patent Law in Great Britain.

Special Agent Roland R. Dennis, writing from London, tells of the effect of the new law in the United Kingdom concerning patents, under which the article patented must be produced in that country or the patent will be canceled. American and German firms are already arranging to establish factories in Great Britain in order to hold their patents. The United States law does not have such a requirement, though it is a peculiarity of the laws of Germany, France and other European nations. Mr. Dennis says:

At the 1907 meeting of the National Association of Agricultural Implement and Vehicle Manufacturers the chairman of the committee on tariff devoted a considerable portion of his report to the subject of patents in the different countries of the world. He took up in a comprehensive manner the charges made for issuing a patent and the subsequent fees payable and the other requirements necessary to keep the patent alive. I quote from the report as published:

"With nearly every nation, aside from the United States, the burden upon the inventor is exceedingly great, particularly to foreigners; not only on account of the excessive taxation, but inability to 'work' the patents covering their inventions. Our government has no requirement other than fees amounting to $35. No taxes are called for, and no 'working' required."

On January 1, 1908, the Patent and Designs Act, 1907 (7 Edward 7, chapter 29), went into effect in Great Britain and very greatly altered the position of any foreigner applying for a patent in the United Kingdom. The fees as noted under the new act are as follows (£=$4.86):

(a) On application for provisional protection. £1
On filing complete specification..... 3
On sealing (or granting) of the patent.. 1

5

(b) Further, before end of four years from date of patent 50

(c) Further, before end of eight years from date of patent 100

Or in lieu of the fees of £50 and £100 the following annual fees:

Year.	Amount.	Year.	Amount.
Fourth	£10	Ninth	£15
Fifth	10	Tenth	20
Sixth	10	Eleventh	20
Seventh	10	Twelfth	20
Eighth	15	Thirteenth ...	20

Making the total of fees payable during the life of the patent—fourteen years—to be £155 ($754.30).

Paragraph 27 is the one most objectionable to the foreigner and one that virtually prevents the patenting of small improvements on any foreign-made machines now being sold in the United Kingdom. I give this paragraph in full:

27. (1) At any time not less than four years after the date of a patent and not less than one year after the passing of this act, any person may apply to the controller for the revocation of the patent on the ground that the patented article or process is manufactured or carried on exclusively or mainly outside the United Kingdom.

(2) The controller shall consider the application, and if after inquiry he is satisfied that the allegations contained therein are correct, then, subject to the provisions of this section, and unless the patentee proves that the patented article or process is manufactured or carried on to an adequate extent in the United Kingdom, or gives satisfactory reasons why the article or process is not so manufactured or carried on, the controller may make an order revoking the patent either—

(a) Forthwith; or

(b) After such reasonable interval as may be specified in the order, unless in the meantime it is shown to his satisfaction that the patented article or process is manufactured or carried on within the United Kingdom to an adequate extent.

Provided, that no such order shall be made which is at variance with any treaty, convention, arrangement, or engagemnet with any foreign country or British possession.

(3) If withi nthe time limited in the order the patented article or process is not manufactured or carried on within the United Kingdom to an adequate extent, but the patentee gives satisfactory reasons why it is not so manufactured or carried on, the controller may extend the period mentioned in the previous order for such period not exceeding twelve months as may be specified in the subsequent order.

(4) Any decision of the controller under this section shall be subject to appeal to the court, and on any such appeal the law officer or such other counsel as he may appoint shall be entitled to appear and be heard.

Legal.

In the matter of the case of the Western Union Telegraph Company vs. the Gulf, Colorado and Santa Fe Railway Company, which case involves the anti-pass law of Texas, and which was argued in the United States Circuit Court for the northern district of Texas, the Hon. Edward R. Meek, judge of the court, at Dallas, Tex., sustained the petition of the complainant.

The suit was brought by the Western Union Telegraph Company against the railroad named to compel it to keep its contract, which was enacted before the anti-pass law became effective. This contract set forth that all authorized officers and all persons in the employ of the Western Union Telegraph Company, when traveling on business for the company, should be transported free of charge. The contract also stated that the said railroad company should transport and distribute free of charge all poles and other material and supplies for the construction and maintenance of offices of both the complainant and the defendant at places along and adjacent to said railroad.

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United States Military Telegraph Legislation.

David Homer Bates, one of the "sacred three," so-called, cipher operators, serving in the War Department telegraph office during the Civil War, and who has been active in seeking to ameliorate the condition and determining the true legal status of the surviving members of the military telegraphers, figures in the following correspondence, which explains itself:

658 Broadway, New York,
March 2, 1908.

HON. SERENO E. PAYNE,
HON. JOHN DALZELL,
House of Representatives,
Washington, D. C.

Dear Sirs:

LORIMER BILL 175 NOW IN HANDS OF INVALID PENSIONS COMMITTEE.

The above bill is supplementary to the act approved by Grover Cleveland January 26, 1897, which by its terms, placed the members of the United States Military Telegraph Corps during the Civil War in the ranks of the United States Army.

During the war, because of the confidential character of their service, they were in effect soldiers, but were not enlisted or commissioned because President Lincoln and Secretary Stanton decided for the good of the service not to have them mustered in on the ground that if this had been done, they would necessarily be subject to the orders of their superior officers, and it might occur that thus through inadvertence or otherwise the army telegraph cipher codes and cipher dispatches might be divulged and important army movements interfered with.

The writer entered the military telegraph service April 27, 1861, serving during the entire war and until August, 1866, as cipher operator and manager of the War Department telegraph office and feels competent to speak in behalf of less than two hundred survivors out of one thousand five hundred, at the maximum, who rendered what we claim was most important and valuable service to the government during its crisis. Many of our number are past three score and ten, some are paralyzed or otherwise disqualified for earning a living.

We therefore appeal to our Representatives in Congress to do us the simple but tardy justice of favoring the Lorimer bill which in effect would give a small pension to less than two hundred survivors.

Very truly yours,
D. H. BATES,
Secy. Ex. Com. U. S. M. T. Corps.

COMMITTEE OF WAYS AND MEANS,
House of Representatives,
Washington, D. C., March 16, 1908.

MR. DAVID H. BATES,
658 Broadway, New York City.

Dear Sir:

Yours of the 12th inst. was handed to me by Mr. Olcott. I am not in favor of extending pension to those who were not enrolled in the army. I am opposed to any civil pension bill of any kind. If we gave pensions to telegraphers in the army it would not be long before we should have another deserving class of civilians asking for pensions, and we should find ourselves confronted by precedent for numerous classes of private pensions.

Yours very truly,
(Signed) SERENO E. PAYNE,

To the communication of Congressman Payne, Mr. Bates returned the following answer on March 21:

HON. SERENO E. PAYNE,
House of Representatives,
Washington, D. C.

Dear Sir:

Your reply of March 16 to my letter re above bill received. You say you are opposed to a "Civil pension bill of any kind" for the reason that "if pensions were given to army telegraphers (during the Civil War) it would not be long before we should have another deserving class of civilians asking for pensions and we should find ourselves confronted by precedent for numerous classes of private pensions." The logic of which is that you are afraid to do justice to a small and specially deserving class (less than two hundred) for fear that another "deserving class" may apply and that Congress would not have the courage to withstand the pressure. But the question arises, Were military telegraphers in the civil service? We claim that we are already in the United States army. The special act of January 26, 1897, places us there by direct mention. We were under the immediate control and direction of the Commander and Chief and the Secretary of War, whose orders would not allow even the commanding general in the field to interfere with our secret cipher duties.

All we ask under H. R. 175 is that, having rendered specially important and invaluable service under the same risks as were suffered by regularly enlisted soldiers, the paltry number of survivors of the United States Military Telegraph Corps shall be allowed a soldier's pension.

We assume that there is no other reason than the one you have given for your opinion expressed in your letter.

Yours with great respect,
DAVID HOMER BATES,
Secy. Ex. Com. U. S. Military Telegraph Corps.

When it is up to the politicians in any given state to assess the local property of a telegraph company, the figures arrived at are usually far and away in excess of its real value. Were these same politicians called upon to express an opinion as to the value of the telegraph plant in case the government should conclude to take over the property, how ridiculously infinitesimal would become the same figures.

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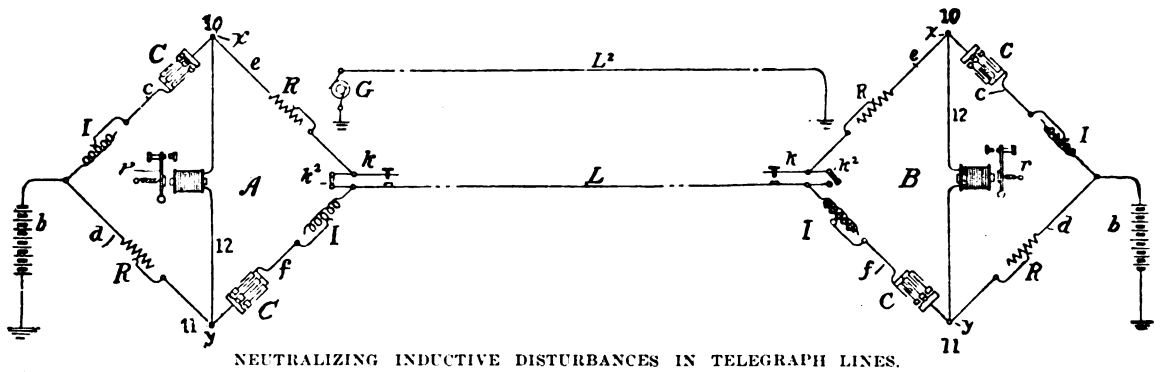
Neutralizing Inductive Disturbances in Telegraph Lines.

The introduction of the single-phase electric railways has caused trouble in the operation of many adjoining telegraph lines, due to inductive disturbances set up in the latter interfering with the normal operation of the relays or other receiving instruments. To overcome these effects an interesting system has been invented by Edward Blakeney, of Ossining, N. Y., and Robert E. Chetwood, Jr., of Elizabeth, N. J., and the patent on this method has been assigned to the American Telephone and Telegraph Company.

To understand the conditions it is nesessary to consider that the ordinary telegraph system is one in which the relays are operated by the presence or absence of direct current. In other words, it is organized for operation by the normal slowly recurring current impulses of standard Morse signals manually transmitted. If the line has near it a conductor through which passes an alternating current, a similar current will be induced in the telegraph line which will be superposed upon the operating current. A class of



NEUTRALIZING INDUCTIVE DISTURBANCES IN TELEGRAPH LINES.

alternating current which is at the present time often encountered is that of single-phase and of comparatively low frequency, yet high relatively to Morse transmission, say, twenty-five cycles per second, which is employed for power transmission and some railway work. The electromotive forces producing such currents are usually extremely high, and of course change abruptly from their maximum value to zero, giving powerful inductve effects, yet the frequency is not so great but that the armatures of the relays can follow the alternations induced in the line. As a result the operating current assumes such an undulatory character that the signals are distorted and confused by the vibration of the armatures. To exclude the alternating current from the telegraphic receiving elements and thus prevent this disturbance and to provide a system by which signals may be effectively transmitted and received without interference or confusion are the principal objects of the invention.

It consists in a means for furnishing separate paths for and confining thereto currents of diverse characteristics. The system herein described is in the form of a Wheatstone bridge circuit, with which the receiving element is associated and which excludes alternating current from the receiving element by virtue of the establishment of a condition of equipotential at the extremities of a bridge or cross conductor in which it is placed, while the bridge is thrown out of equilibrium for operating currents and made a portion of their exclusive path by the presence of inductive devices in a portion of the branches of the balance circuit to which telegraph currents are relatively impassable.

Referring to the accompanying diagram, telegraph stations (A) and (B) are provided with sending and receiving elements (k) and (r), respectively, and between which extends the line conductor (L). This conductor is shown as grounded at its extremities to complete the main circuit, though obviously a complete metallic circuit could be substituted if desired. The circuit contains batteries (b) or other suitable sources of operating current.

Situated in such proximity to the line as to act inductively upon it is shown a conductor (L^2), constituting, for example, a portion of a railway circuit that carries an alternating current flowing from a generator (G), which is of such periodicity that a disturbance will be produced in the telegraph line prejudicial to its operation.

To nullify the effect of these parasitic or disturbing currents and to prevent the receiving instruments (r), which are shown in the drawing as relays, from being affected thereby, the line (L) is divided at each station, there being two conductors (10) and (11) connected in parallel to form a section or extension of the main circuit. these parallel branches of the line are separated into portions (c), (d), (e) and (f) by a bridge conductor (12) connecting the points (x) and (y) in the branch conductors, and in this bridge conductor of each station is connected its relay (r).

It will be seen that each of the station circuits just described is arranged in the manner of a Wheatstone bridge, the portions (c), (d), (e), (f) of the conductors (10) and (11) furnishing the four sides, while the conductor (12) provides the cross-wire or bridge. As is well known, when the fall of potential, say, the side (c) of the balance is to that in the side (e) as the fall in the side (d) is to that in the side (f), the points (x) and (y)

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will be of equal potential and therefore no current will flow through the bridge path. Therefore, to nullify the disturbing effect of the energy existing in the conductor (L^2), while still permitting telegraphic operation, it is only necessary to secure equality of potential for alternating currents, while for direct currents the bridge is unbalanced.

This result may be attained by so adjusting the impedance of each side that with reference thereto the equation $\frac{c}{d} = \frac{e}{f}$ will be satisfied, and by employing in the conductors (10) and (11) at opposite sides of the bridge reactive devices such as condensers which are impassible to direct currents while permissive to alternating currents, and including in the companion sides impedance devices allowing currents of both characteristics to pass. In each of the sides (c) and (f) of the balance circuit are shown coils (I) possessing both resistance and inductance, this being preferably adjustable, and in series with the coils (I) in diagonally opposite portions of the parallel branches are condensers (C) which are shown as being of variable capacity. In each of the arms (d) and (e) is a suitable resistance (R), also preferably adjustable.

When the impedance in the various sides is balanced in the manner previously stated, the bridge (12) will be neutral to the induced alternating currents, which will flow through both the parallel branch conductors, passing inductively through the condensers, and to ground through the battery, thus leaving the relays unaffected. But upon making and breaking the main circuit by means of one of the keys the impulses will pass through the line, and since the condensers are conductively discontinuous for, or are impassable to, direct, slow-changing currents, the circuit is unbalanced as far as these are concerned, and they flow exclusively through the sides (d) and (e) and the bridge connection, these constituting the sole conducting path through the bridge circuit, and operate the relays in the usual manner.

In balancing the circuit the frequency of the disturbing current should be considered, and, as this is liable to vary, such values of resistance, inductance and capacity should be chosen as will not greatly disturb its equilibrium if slight changes in frequency occur. This may be determined experimentally or mathematically, until such values are found that the impedance will vary but little for the expected fluctuation in the frequency. In any event, the resistance in the sides (d) and (e) should be kept as low as possible to avoid cutting down the operating currents they carry. Also, if such devices for any specfic case are not unduly large, air-core coils preferably should be used in the sides (c) and (f), as is illustrated at station (A), since their inductance is reasonably constant within a wide range of practical conditions, and with non-inductive resistance in the arms (d) and (e) the circuit would remain substantially balanced for any particular frequency, regardless of the magnitude of the induced current. It may be found, however, that to secure the necessary inductance air-core coils are too cumbersome, and in such case those having iron cores may be employed, as is shown at station (B).

There are four portions of the circuit in which each of the keys (k) may be placed to effect the transmission of signals—in the bridge (12), in the line outside the balance circuit, or in either one of the sides (d) or (e) which the operating currents traverse. If located in the first-named position, the key is shunted by two circuits of large capacity furnished by the arms (c d) and (e f), respectively, so that, although the relay of the sending operator may respond properly, that of the distant station will be sluggish. With the key in the line, if the circuit is not properly balanced, some of the alternating current may pass through the bridge, and the operating current therein becomes more or less undulatory. This being the case, the action of the relay is liable to be irregular, as the key may be closed, considering the extremes, at either the period of maximum or minimum current. The most advantageous location for the key is in one of the sides (d) or (e), since when the key is open the condenser in the other branch is charged by the line batteries, and upon closure is discharged, giving a strong current impulse, which is sufficient to overcome any lagging tendency of the line current. In connection with each of the keys is shown the usual circuit closer or switch (k^2), by which the continuity of the circuit may be preserved when the operators are not transmitting. The switch at the station (B) appears as open, or in the position for transmission.—Western Electrician.

American Institute of Electrical Engineers Nominations.

The following nominations have been made for officers of the American Institute of Electrical Engineers, which, as there is no opposition, is tantamount to their election:

Louis A. Ferguson, Chicago, president; Cummings C. Chesney, Pittsfield, Mass; Calvert Townley, New Haven, Conn.; Bancroft Gherardi, New York; vice-presidents; D. B. Rushmore, Schenectady; H. E. Clifford, Boston; W. G. Carlton, New York; C. A. Stone, Schenectady, managers; G. A. Hamilton, New York, treasurer, and Ralph W. Pope, New York, secretary.

Higher Patent Office Salaries.

Partly as a result of the recent scandal in the patent office, when one of the examiners was accused of collusion in the fraudulent granting of a patent, together with the subsequent revelations of the difficulty of keeping capable technical men in the government service because of the small pay, there will be a general increase made in the salaries paid to employees there. The total appropriation for the patent office is $1,208,010, which is an increase of $76,700.

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Experiences of Linemen.

When you use a telephone or turn on an electric light or send a telegram, do you ever stop to think of the men whose hands have touched every inch of the wire that carries your voice, or your message, or the electric spark? Of the men whose labor in putting the wires in place makes possible your use of them? To be sure, you have a dim, half-formed consciousness that you are using a most wonderful device that eliminates space in Aladdin-like manner, and, perhaps, a vague, momentary feeling of satisfaction that such conveniences are at your disposal. Maybe a fleeting thought of the master mind that invented the mechanism comes to you—to be discarded, half completed, the next instant when the commonplace, everyday usage of the necessity makes an indulgence in romantic speculation as to the how and the why of it absurd.

But there is a romance in the call of the telephone, the "click-click" of the Morse and the flare of the incandescent. It is not in the instrument itself, nor in the wire, but in the lives of the men who do nothing more noteworthy than the simple stringing of the wires, the men behind the guns, so to speak; the men who walk on the housetops and risk their lives daily at the top of telegraph poles with death humming and singing along a metal core but a few inches from their faces.

An item in the papers told of the thirty-foot fall of a lineman from the top of a pole. His leg was broken and his bruises were many. Daily the telegraph news of the papers bring tales of similar fatalities in various cities. Here a man is dashed to pieces on the pavement, and the curious crowd gazes up at the top of the pole from which he fell, and mutely wonders what it must feel like to fall from that distance. There a man is electrocuted, and speculation is rife as to why he became so neglectful as to come in contact with a live wire. Another dispatch narrates the fall from a roof of a lineman so interested in the adjustment of his wires that he failed to notice the bit of ice under his foot until he suddenly felt himself sliding down the roof, grabbing, clutching, striving with every muscle in his writhing body to strike some projection and avert the sickening thud below.

The life of the lineman is fraught with danger, and death works side by side with him each day. Eternal vigilance is in his case the price of life. Careful and cautious as he may be, there is always the chance that some slight detail will be remembered only when it is too late. Many a terrible struggle for life and countless stubborn, courageous battles against impending death have been grimly fought out by the men who walk on the house tops and cling to the towering poles while the rest of the world passes by underneath unaware of the tragedy that threatens above.

"Yes, I suppose it is a dangerous business," said a foreman of a construction "gang," "but I've been in it so long—for over twenty-five years—that I think of that side of it only when some poor fellow 'gets his,' as they say. In handling my men, however, I have never for a moment been unmindful of the danger they are subject to in the twinkling of an eye. And I've never sent a man up a pole or across a roof that I myself was afraid to try.

"There's a peculiar thing about a construction 'gang,' do you know? Just let one man become nervous and panic-stricken, for ever so slight a cause, and the rest of them follow him like a flock of sheep. Occasionally you find a man whose nerve is cast-iron or whose brain is slow to realize danger. He sticks, and he is usually picked up crushed and lifeless or horribly maimed and crippled. I have not seen many accidents in my day, but those I have witnessed have been ghastly in their suddenness.

"The spur which every lineman wears on the inner side of each ankle is intended to enter the pole, in climbing, as nearly horizontal as possible. A new man is taught how to ascend a pole in this manner. An old hand sometimes becomes careless or the wood has become rotted through exposure to the elements. The lineman ascends quickly, putting all of his weight on one spur as he lifts the other leg for the next step. Bingo! His spur has gone into the wood—at an angle—and out again, and he falls. That is called 'cutting out.'

"On the other hand, there are many men in the business who can ascend to the top of a pole, clasp their arms around it, remove their spurs from the wood and drop twenty feet and more, with a speed almost equal to falling, and catch their spurs in the pole again, stopping their descent a few feet from the ground. I knew a man once who invariably descended in this manner because it saved him the tedious exertion of climbing down step by step. He got his one day, though not in performing his favorite trick.

"The great danger in work on a housetop is that the lineman accustomed to clinging to a pole feels so secure on the broad roof by comparison that he becomes extremely negligent. This roof-top work, however, is rapidly becoming a thing of the past, for the companies all over the country are sending their wires into buildings direct.

"On a number of buildings in the business section of the city you will find, in large white letters painted on the walls, the warning, 'Linemen Keep Off My Roof.' The owner places the warning there with no thought of the lineman's possible danger, however, but merely because of probable injury to his tin roof by the men walking over it. Only in rare cases is his "keep-off-the-grass' sign disregarded, for but little roof work is done by the companies.

"Without doubt, the most dangerous part of the business, from a construction man's point of view, is the erecting of poles. It used to be that sixty and seventy-foot poles were used and many a time I have held my breath until the rocking,

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swaying monster was upright in its hole. Three props, called 'dead men,' are placed under the pole as soon as it has been sufficiently elevated by the piles (long poles with sharp steel spear-heads at the end) of the men. The butt of the pole gradually sinks into the hole as the elevation increases. Then is the dangerous moment. The pole must be balanced to a nicety. A sudden turn or an unexpected jar will send it thundering to the earth again and the men must be quick to jump from under it. I've seen several men caught in this manner and crushed into an unrecognizable pulp.

"But the tendency is now to use shorter poles, most of them being not over twenty-five or thirty feet in length. A derrick, attached to a wagon bed, also does away with much of the danger in lifting the pole. In fact, the good old days are passing rapidly for the construction men. The risk, you know, is somewhat attractive. Why, I can remember the time when I preferred jumping three to four feet from one roof to another to going downstairs to the street and up again to the roof of the next house."

But a few months ago a construction man in the local office of a telegraph company had a most thrilling experience on the roof of a building. The roof is a peaked one with slanting sides.

"I was working on the roof," he said, "putting in a wire for a messenger call box. The previous night's rain had frozen and the roof, in addition to being slanting, was in the literal sense of the word 'as slippery as ice.' I remember I took the precaution to wear my rubbers in order to gain a better foothold. Turning suddenly for another tool from my bag, which I had balanced on the ridge pole, I slipped—though I didn't know that was what had happened until I realized that I was flat on my back, speeding along the roof streetward, with what seemed to me to be the velocity of an express train. As long as I live I shall never forget the horror of that moment. I didn't know what I thought or what I felt. I only know that the dull, ghastly thud of my body on the pavement below rang in my ears for fractions of seconds that seemed centuries in duration.

"I grabbed, I clutched, I squirmed, I twisted, I tried to flatten myself out; but down, down, down I went. Do you know what it feels like to know you are going to die a horrible death? Pray God you never will! Flat on my back I flew to my doom. And then—it is the happiest sensation I ever had or expect to have in my life—I stopped! Dazed, sick, doubting, I finally gathered sufficient strength to look to see what had saved me. To my utter amazement I found that my heels had caught in the rain-spout gutter, which was constructed unusually high above the level of the roof. But a few inches more and I would have dashed over. I believe I lay at least five minutes in that position with my knees doubled up and my feet pressing that blessed rain-spout before I dared to move. Then my pals passed me a rope."

"Though most of the work done nowadays is in conduits underground," said another construction man, "the old system of the overhead wires was far safer for the linemen. In the air all you've got to watch out for is a fall or coming in contact with a live wire. In the present system you are standing on the ground, which, of course, makes the deadly ground circuit possible at any time. Something has gone wrong along the line. A 'trouble' man is sent out to fix it. By a mistake, surprisingly easy to make through a misunderstanding, he cuts into the wrong cable, and instead of finding a wire with no 'juice' in it he runs into several thousand volts. Often the force with which he is hurled backward breaks every bone in his body. Many of us carry marks of contact with live wires touched years ago. We usually do our work silently so that no mistakes may be made. It is worth that and every other precaution possible—for you never know when you'll 'get it.'"

There is a lighter side to the work of the linemen, however, and one which serves to mitigate the stern knowledge of their dagerous profession. Many amusing anecdotes are told of enraged tenants and landlords who refuse to allow the linemen access to their roofs to run in a wire to the next building; of women who sit for a whole day in a freshly dug hole to prevent the erection of the landscape-disfiguring pole, and of 'fool questions' asked by curious spectators and asinine suggestions as to the way in which this or that piece of work ought to be done.

One of the telegraph men rejoices greatly in a story he is fond of telling, and in which he was one of the "goats."

"Not so very long ago," he says, "I was with a gang erecting a line along a country pike. Just before noon we reached a lunatic asylum and put up several poles before we knocked off for lunch. The wide stone wall around the asylum seemed a most inviting table for our dinner pails, so we all perched along it. Within the inclosure several dozen of the inmates were at work hoeing corn. We watched them rather curiously at first, but their actions seemed perfectly rational, so we gradually lost interest. Suddenly there was the most war-whoop yell you ever heard. Every man-jack of us jumped to his feet. Across the cornfield, waving their arms and brandishing their implements and shouting like demons, came the whole pack of the insane, each one of them a most terrifying 'Man With the Hoe.' They charged upon us in platoons, with their keeper far in the rear. Did we wait? Not a bit of it. Intuitively, I suppose, we all made for the two lone telegraph poles we had just erected. There was a regular fight for 'first-up.' Spurs bit deep into the wood, and one man ascended on the next man's heels. It must surelv have been a comical sight to see those two poles fairly alive with clinging, frightened men and the lunatics dancing around us and holding high carnival. And to make matters worse, they climbed into our wagon, grabbed armfuls of the glass insulators used

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on the crossbars to hold the wires and played 'knock-down-three-babies-and-you-get-a-half-dozen-cigars' with us. Those insulators weigh a pound or so apiece, and those lunatics may have been crazy, but there was nothing the matter with their pitching arms. We carried bruises on our bodies for weeks afterward. Of course, the keepers finally corralled them. But we stayed up those poles until the last sportive victim of 'dementia Americana' had disappeared."

"I went out with a gang to plant a few poles in a truly rural district in southern Maryland one bright, sunny day," said another lineman, "and began the usual course of procedure on the property of an old woman. She was armed with her order from the company for $1 for the usual square foot of her land on which the pole was to be placed. We started to dig. She pulled out her tape measure and measured the incision in the land. It was about six inches over a foot. We explained to her that the dirt would be put back and only a foot of her land used for the pole. Then we made the three other jabs with the spade to complete the square foot. Whew! She was on us like a vulture. 'What were we doing?' 'She had only sold one foot and here we were digging three extra ones!' The boss tried to explain to her what a square foot meant, but she couldn't understand. 'No, siree! robbers! thieves!' She had only sold a foot. The foreman took her aside to ask her how in the name of all that's holy could he put a sixty-foot pole in a hole a linear foot in dimension and gave us the wink. When the poor old lady finished her scathing tirade we had a nice hole dug a foot square and five feet deep. We jammed the pole in double-quick, I can tell you. Then she insisted on $3 more for the feet on the surface and almost took our breath away by asking $5 more for the depth of the hole. We told here to make her complaint to the proper authorities of the company and left her hacking away at the poor pole, a foot or so in diameter, with her carving knife."

"Men who are held in readiness for breaks and leaks, etc., in the feed cables," said an electric construction man, "are called 'trouble men,' and they certainly are appropriately named. All sorts of queer and unreasonable wails come into us from subscribers. One evening last summer some lady made a complaint over the phone in that chilly, touch-me-not voice usually considered so effective in dealing with mere servants of large corporations.

"'It's outrageous!' she exclaimed, 'here I pay your exorbitant rates for light and the service is getting worse every day. I want you to send a man up right away to do something to keep these horrid, black bugs from flying around my lights! Right away, do you understand!'"—Washington Star.

You can't afford to be without TELEGRAPH AGE; $1.50 a year.

Railroad Telegraphers Hear Practical Talk.

Chief Despatcher E. L. Graul, of the Philadelphia and Reading Railway, recently gave a practical talk to the telegraphers of the Reading division of that road at Reading on the nine-hour law. Among other things he said:

"The first thing I wish to impress upon your minds is that while many of you work but eight hours a day the law says nine. When you relieve each other, don't be in a rush to get away. See that the man relieved is made acquainted with what is going on so that there can be no misunderstandings.

"If a scheduled train has not passed on time, inform your relief of the fact. I want you to work in harmony with one another and check up your daily business the same as the despatchers. Another point I wish to impress upon your minds is that I desire that you keep your offices and towers in perfect order and do not depend too much upon your students, as you will be held strictly responsible for the faithful performance of the duties of your office.

"Now that your hours have been cut down I expect more from you than when you worked twelve hours. There must be no sleeping on duty. No excuse will be accepted for this. Don't permit persons to frequent your offices who have no business there. This is against the rules of the company and will not be permitted. The telegraph office is not intended for that purpose.

"Get to your work on time. You have sixteen hours to do this. I don't want to hear any complaints of this character. There is also too much unnecessary talking on the wires. Cut that out. Some of the operators are in the habit of using profanity on the wire. This must cease. I have been told that some of the older operators are in the habit of rubbing it in on the beginners. Don't do that. You were all beginners once, and it is unfair and won't be tolerated.

"Don't abbreviate in sending telegrams. Spell out your words. Abbreviating is a bad practice as all operators are not familiar with that line of work; besides, it's dangerous. When a message is handed to you relating to delays of traffic get it to the chief despatcher's office as promptly as possible. Watch all trains as they pass your respective offices and see that they have the rear end. Note whether there are any hot boxes, etc., and report such matters promptly.

"It is up to you to keep the traffic moving and the new law, as far as it relates to the railroad service, must be lived up to. The operators are in a manner responsible for many delays and this will no longer be permitted.

"There is entirely too much contention for wires on the part of some operators, especially by the younger element. Stop it. Listen and watch the adjustment of your instruments before opening your keys. Always use judgment, especially in damp weather when the wires do not work clearly. Do your duty and that is all that is expected of you."

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Wireless Communications Over Sea.*

BY J. ERSKINE-MURRAY.

Although the principal subject of the present paper is electrical wireless telegraphy, it may be as well to commence with a short survey of marine communications in general, since, owing to a vessel's motion, all methods of communicating with it are necessarily "wireless." In every case some type of wave motion is used as the means of transmitting the signal or message. Sound, which is one of the commonest, and perhaps the simplest form of wave motion, has served since the first dug-out canoe of prehistoric times was launched, and will continue to be of use as long as the human voice exists. That extremely simple instrument, the speaking trumpet or megaphone, renders communication easy up to several hundred yards in moderate weather, and only fails when the sound is drowned by other noises, or when a high wind carries it upwards and backwards, and so prevents it reaching its destination. The siren, though much more powerful than the megaphone, suffers, but in a less degree from the same disadvantages, and since it is slow in action and occasionally fails and splutters at critical moments, is not of much use for anything but the simplest of signals. One great disadvantage of the whistle or foghorn as a means of indicating the presence of a vessel during thick weather is that, owing to the quality of its tone, the air seems to be filled with sound, and the ear can not determine whence it comes. A deep note is essential in order that the sound may carry a long distance, but the quality of tone of an ordinary whistle or horn is about the worst that can be used in cases where it is important to distinguish the direction from whence the sound comes. What is wanted is a note rich in the upper harmonics, like the sound of a trumpet or motor horn, and not a pure tone like an organ pipe, to which the modern siren more nearly approximates.

Submarine Signaling.—For very many years it has been known that sound travels far more easily in the sea than in the air. The sea, except just at the surface, is quiet and free from turbulence; there are no currents running at more than a very few miles per hour, and vortex motions, which are probably the greatest hindrance to the propagation of sound in air in stormy weather, are extremely rare. In addition, the actual speed of transmission of sound is much greater in water than in air, the values being about 1,100 feet a second in air, and 4,700 feet a second in water. It is only recently, however, that any considerable advantage has been taken of these most valuable properties of the sea itself. Perhaps the long delay has been on account of the difficulty of satisfactorily conveying the sound from the water to the ear of the listener. Recent experiments have, however, entirely overcome this difficulty, and it is now possible to hear in a telephone on the bridge of a ship the sound of a bell rung under the water from ten to twelve miles off. This system of submarine bell signaling has been much developed during the past few years, and it may be of interest to note that up to last July not less than 294 vessels, chiefly belonging to passenger lines on the North Atlantic, and seventy-four lightships, have been equipped with submarine bells and apparatus for the reception of submarine signals from a distance. Bells which are intended to act as fixed points by which vessels can find their course are usually made to strike a distinctive number of strokes after the manner of a flashing light.

This method of wireless sound signaling has already proved of great assistance to navigators during foggy weather, and the fact that it is possible by its means to locate the direction of the buoy or lightship to which the bell is attached, with very considerable accuracy, from a distance of several miles, gives it an advantage over most other signaling systems, which will certainly lead to its adoption in the near future in all narrow waters where fog is of frequent occurrence.

Sounding by Sound.—Some years ago the writer devised a method of sounding by means of the echo from the bottom of the sea, and more recently the matter has been taken up independently by an American inventor. The attainment of satisfactory results depends on the solution of a simple and well-known problem, viz., the measurement of the short interval of time between the moment at which the sound wave is started from the ship and the moment at which it returns as an echo from the bottom. On account of the high velocity of sound in water the time taken for the echo to return from depths less than twenty or thirty fathoms is so short that it is difficult to register, but for greater depths there is no difficulty on this account. The apparatus would therefore not displace the lead line or Lord Kelvin's sounding machine, except as a very rapid means of taking the deep-water soundings, such as would often be advantageous on approaching a coast at high speed or in foggy weather.

Signaling by Light.—Passing by the well-known methods of flag and semaphore signaling, of Colomb's flashlight code, and of rockets and arrangements of lanterns, I may mention the recent developments of photophony, or light-telephony, a system of communication invented by Alex. Graham Bell in 1879 but only in recent years brought to the stage of practical utility. Telephone messages have been transmitted by means of a beam of light from a searchlight to a distance of eight or ten miles, the sender's voice being heard with perfect clearness. The system, however, suffers from the great disadvantage common to all visible signals, whether lighthouses or more complex arrangements, that they become useless during foggy weather and in snowstorms.

* Abstracted by the Electrical Review, of New York.

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It is somewhat strange that mariners should have had to depend for so long on a type of signal which is bound to fail just at the moment when its aid is most needed. The explanation is, of course, that up till recent years mechanical and electrical apparatus were too much of a mystery, and required expert handling. This is now no longer the case, and means of signaling more certain in themselves than the older methods, though demanding a small modicum of technical knowledge and manipulative skill, are rapidly being added to the time-honored methods, and will, to a certain extent, displace them in the future.

General Principles of Wireless Telegraphy.—These may be summed up shortly, as follows:

1. The energy which transmits the signal is propagated over the earth's surface as an electric wave motion.

2. This wave motion, or alternate current, may be either uniform like an ordinary lighting or power current, or it may be in the form of damped wave trains, i. e., in short series of waves following one another at comparatively long intervals; each series or train commencing strongly and dying out after comparatively few waves. In the first case a high frequency alternate-current generator, or a vibrating electric arc may be used; in the latter, the intermittent spark discharge of a condenser.

3. In both cases it is necessary that the frequency of the current (number of alternations per second) should be high in order that the amount of electricity set in motion at each wave, and, therefore, the actual dimensions of the apparatus, may not be too large. This will be appreciated when it is recollected that a small quantity of electricity, or any material, when moving very rapidly, may transmit a large amount of energy. (A high-speed de Laval steam turbine is a good mechanical instance of this.) A high frequency is thus advantageous from an engineering point of view, though it is not absolutely necessary.

4. The receiving apparatus must, therefore, be capable of detecting and indicating currents whose frequencies are greater than 100,000 per second. There are now scores, possibly hundreds, of ways in which this may be done. These may be classed as follows:

(a) Imperfect electrical contacts, or coherers, whose resistance is changed by the action of the received current; (b) electrolytic detectors, which indicate the received currents by an alteration in polarization; (c) thermometric detectors which indicate the current through the effects of the change of temperature it causes; (d) magnetic detectors in which the magnetic state of a piece of magnetized iron is altered by the current; (e) electromagnetic detectors on the current balance, or electro-dynamometer principle; (f) valves or rectifiers, which, owing to their property of permitting current to pass more easily in one direction than the other, produce a more or less unidirectional and, therefore, measurable current directly from the alternating current received; (g) a miscellaneous class whose methods of action have not yet been explained.

The best known forms of coherer are (1) the Marconi, consisting of a glass tube of about five millimeters bore in which are two silver plugs about 0.5 millmeter apart, between which a small quantity of very fine nickel filings are placed. The gap is usually V-shaped to admit of regulation by merely turning the tube, as the filings only occupy about one-third of the space and are, therefore, more or less crowded together according as the wide or narrow end of the V is uppermost (2) The Lodge-Muirhead, which consists of a razor-edged steel wheel about the diameter of a threepenny bit, whose edge dips into mercury covered with oil, and which is kept revolving by clockwork. The Marconi coherer, which is a modified form of Branly tube, and is also used by the Telefunken company, requires to be decohered by tapping or shaking it after it has recorded a signal, as it would otherwise remain cohered. This, though apparently a disadvantage, is in reality the essence of its success, for it is owing to this that it was first possible to maintain the effect of the passage of the high-frequency current long enough to obtain from it a permanent record of the Morse tape by means of ordinary telegraph instruments. The Lodge-Muirhead coherer is decohered after a small fraction of a second by the movement of the wheel.

The other detectors most in use are Marconi's magnetic detector and the electrolytic receiver, or barretter, invented by Fessenden. Magnetic detectors are based on the fact that a high-frequency current, even if of very short duration, may produce considerable changes in the magnetism of a fine magnetized iron wire. In Marconi's form an endless band of fine iron wire is kept traveling round two pulleys. Surrounding one of the straight pieces between the pulleys is a small glass tube on which are wound two coils of fine insulated wire. One of these is connected to the aerial and earth wires, and the other to a telephone receiver. Two permanent magnets are placed so that their lines of force include part of the traveling iron band in their circuit. The motion of the band draws the lines to one side through the retentiveness of the iron for magnetism. The high-frequency current in the aerial wire, on passing through the small coil round the iron band, suddenly demagnetizes it, or rather releases the lines of force. These spring back into a position at right angles to the band, and in so doing cut the coil connected to the telephone, induce a current in it, and thus produce an audible click in the instrument. The motion of the band soon draws the lines aside again and renders the apparatus ready to indicate a new signal. The Morse "dash" is, of course, represented, as in all systems of wireless telegraphy, by a close succession of dots.

The electrolytic receiver, or barretter, depends

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on the fact that if a constant voltage be applied between electrodes dipping into an electrolyte, one of which is of very small area, the current is, under certain conditions, unstable, and the sudden superposition of a high-frequency current causes a sudden and considerable increase in the direct current. The action is not yet properly understood, though many theories have been stated. A telephone is generally used in connection with this detector, which is one of the most sensitive of all.

It is noticeable that in this list of detectors of high-frequency currents there are very few, if any, which give directly an audible or visible indication of the signal. In practically every case it is thus necessary to have some auxiliary instrument to indicate to the operator that the detector has reacted. In some cases a telephone, syphon recorder, or Morse inker, may be used at will, in others the telephone is the only auxiliary suitable, and it is, therefore, not possible to obtain a permanent record of a message.

5. The waves are propagated outward from the transmitting station, either equally in all directions, or with a maximum in one direction according as the aerial wire is vertical or inclined. In the latter case the strongest transmission is in the direction of the lower end of the wire. This method is used at Clifden and Glace Bay, Marconi's transatlantic stations, and at Knockroe, the Poulsen transatlantic station now building.

The lines of electric force are in general attached to the ground and follow it, as they do a wire in ordinary linear conduction. The resistance and dielectric constant of the ground are important factors in determining the distance to which it is possible to signal with any given transmitter and receiver. In general, the dielectric constant is the more important of the two, and the chief reason why it is more easy to transmit signals over water than land is that the dielectric constant of water is eighty, while for dry sand or rock it is only about five. Thus it is possible to transmit signals very much further over water with a given power than over land. The actual ratio of the distances is now calculable where the natures of the soil and subsoil are known.

6. It is now easy to determine with considerablet accuracy, in fact within a few degrees, the direction from which a message is coming—a discovery which may in the near future become a great aid to navigation, since any two land stations within range of a ship will be able, by making simultaneous observations, to give their bearings, and thus to fix the actual position of the vessel. In these days of ever-increasing speeds it is becoming more and more essential that the shipmaster should be warned, when still a considerable distance away, of his approach to land. This has been done for some years by wireless telegraphy, but it is only recently that it has become possible to add to the warning a statement of the actual position of the ship at the time of sending.

7. The speed of transmission at moderate distances, and the reliability of a wireless connection, are now both as good as the same qualities in an ordinary land wire. A proof is given by the abolition of the post office wire from Hunstanton to Skegness, England, since wireless stations have been erected, and the fact that a speed of ninety words per minute has been attained between these stations.

8. The means of preventing interference between neighboring stations have been developed to such good effect in the last few years that it is now possible, as experience shows, to construct apparatus which will respond only to waves which do not differ by more than about four per cent. from the proper wave length for the station. An even greater sharpness in tuning has indeed been claimed by various workers, and may very probably have been obtained. A margin of four per cent. is, however, sufficient to render possible the efficient working of a very large number of stations in a comparatively small area without interference. The actual wave lengths to be used by ships and shore stations have been fixed in some countries, and in all which are parties to the International Convention, the wave lengths from 600 to 1,600 meters are reserved for naval purposes; wave lengths below 600 meters being available for short-distance stations, and those above 1,600 meters for long-range stations. The usual wave length for the short-distance stations, that is, under one hundred miles range) is about 400 meters. The German long-distance station at Nauen uses wave lengths of 2,000 meters; Poldhu (Marconi) of about 2,500 meters, and Clifden of about 4,300 meters.

A vessel fitted with a wireless apparatus is practically never out of range of a commercial wireless telegraph station as long as it is within sixty or seventy miles off any part of the coast of the British Islands. The same is true of Europe, off the eastern coast of North America, from Labrador to Florida, and for the whole Gulf of Mexico and the West Indies. There are six or seven stations at various points along the east coast of South America, and ten or a dozen stations at points on the Pacific coast of South and North America. On the route to India and the East, there are points of communication after leaving the Channel which simply bristles with stations, at Ushant, Corunna, all around the Mediterranean, including even Tripoli, Tunis and Algeria, Port Said, Port Tewfik, Sauger Island, India; Diamond Island, Burma; the Andaman Islands, the Philippines, Tsingtau, China; the Japanese coast, the Sandwich Islands, and Samoa. In addition to these stations, which are open for commercial work, there are, of course, many more which are intended for naval and lighthouse communications only, but which would be available in case of emergency to any vessel in distress.

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The New Office of the Postal at Pittsburg.

About May 1 the Postal Telegraph-Cable Company will remove its main office at Pittsburg from the Carnegie Building, on Fifth Avenue, to the new Keenan Building at the corner of Liberty avenue and Seventh street. This building is a twenty-story skyscraper of the most modern type, being of steel and fire-proof construction throughout.

The new location is practically at the center of the downtown district and is reached by almost every street car line. It is equidistant from all depots and important hotels.

The new quarters of the Postal company comprise a ground floor office space on Liberty avenue of approximately 85 x 28 feet, in which are located the manager's office and cashier's office and receiving, delivery and messenger departments, a mezzanine floor over this office space, a lineman's department, terminal room, etc., in the basement, and the entire seventh floor. Upon this floor is the operating room, superintendent's offices, locker and retiring rooms for the operating forces, etc. Every detail of this new plant is of the most modern type. The plans for this office were prepared under the immediate supervision of E. J. Nally, vice-president and general manager of the Postal company; by M. M. Davis, electrical engineer, and his assistant, F. E. d'Humy, and they have been carried out under the direct supervision of these engineers.

The ground floor offices are located to the right of the main corridor of the building, directly facing the main passenger elevators. The fixtures are made of white Italian marble and the counter tops of the new carrara glass. This glass has the appearance of white marble, but unlike marble it is not affected by inkstains. The floor is laid in mosaic tile. The manager's office is located in front near the main entrance. The cashiers and receiving clerks are directly back of the manager's office. They are separated from the space reserved for customers by a long counter three feet in width. The top of this counter is entirely free from obstructions of any nature, thus enabling customers to converse readily with the cashiers or clerks. This feature is in marked contrast with previous practice in many offices, where customers have been separated from the clerks by more or less elaborate partitions or grill work. The new plan originates with Mr. Nally. At the rear of the office space the delivery, call circuit and messenger departments are located, the messengers using a doorway at the rear which opens upon an alley. Above the extreme rear of the office space there is a mezzanine floor upon which is located the bookkeeping department. The furnishings of the ground floor offices are in dark mahogany.

A stairway at the rear of the ground floor office leads directly to the basement where the line department and file rooms are located. A fireproof terminal room is also located in the basement, but is placed upon a mezzanine floor so that if the basement should accidentally be flooded the cable terminals will be uninjured. This terminal room is located near to and partly under the sidewalk and there is a manhole in the sidewalk so that an entrance can be effected in emergency from that point. This is a provision to take care of the circuits in the event of a general conflagration such as occurred at Baltimore and San Francisco. The terminal room is equipped with pin jacks mounted in porcelain blocks, and these blocks in turn are mounted upon

THE KEENAN BUILDING, PITTSBURG, IN WHICH ARE LOCATED THE MAIN OFFICES OF THE POSTAL TELEGRAPH-CABLE COMPANY.

iron frames. Any combination of conductors can therefore be made by the use of short cords and plugs. This makes it possible to make quick changes in case of interruption to underground cables.

The lead covered cables which enter the terminal room directly from a manhole just outside of the building line, are, after being connected to the jacks before referred to, carried up to the terminal frame in the operating room through a specially constructed fireproof shaft.

Three high speed elevators connect the ground floor directly with the operating room floor. The elevators and stairways are separated by a fire-

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wall from the operating room, the space between this firewall and the elevators forming an entrance hallway to the operating room and superintendent's offices. The main switchboards abut this firewall in the operating room, and the terminal frames are located between the firewall and the switchboards.

The switchboards comprise four fifty-wire main line panels, one twenty-wire city line panel and one leg board of four rows of seventy-five spring jacks, the latter having capacity for one hundred and fifty duplexes. The switchboards are mounted upon slate which is in turn erected upon angle-iron. There is no inflammable material of any kind used in the construction of the boards except the cherry switchboard shelf. The frames at the rear of the switchboard have a capacity of five thousand terminals.

The switchboards are of the latest type, no cords being used below the switch itself. The spaces underneath the switch shelf are not enclosed, so that the terminal frames and connections are visible from the operating room. The work upon these frames and the switchboards is, however, such that concealment is not necessary. The appearance of the switchboard and frames wired up in this new way is a revelation to those who have been accustomed to wiring done in the old-fashioned way, in which a multitude of wiring sins were covered by polished woodwork.

All switchboards, operating and repeater tables, and special apparatus are connected to the terminal frames by cables. These cables run directly to the tables, etc., in iron conduits laid in the cement floor. The cement floor is covered with rock maple flooring laid in narrow strips. This insures comfort, and the arrangement of conduits does away with covered ducts and their tendency to warping and creaking.

The operating room furniture is of cherry throughout. There are one hundred and six sittings and ninety-six repeater sections. Provision is also made for forty-eight additional sittings and seventy-two additional repeater sections when needed. The operating room has a twelve-foot ceiling and is lighted by windows on all four sides of the building. Artificial illumination is by three-light clusters, located in the aisles, so arranged as to eliminate shadows upon the operating tables and typewriter keyboards. These clusters are controlled by pendant switches so that any cluster may be turned on or off at will. All receiving positions are equipped with extension arm resonators and sending positions with adjustable resonators. The tables are of Postal standard type fitted with typewriter lockers.

The dynamo room is located upon the same floor with the operating department. Ten motor-generators are used in this plant. They are mounted upon a heavy bench, the legs of which are embedded in the concrete flooring. The top of the bench is of slate. The machines are controlled from a slate switchboard which is mounted directly over the dynamo bench. The starting boxes and controlling rheostats and switches are all mounted upon the face of this board directly over the machines to which they connect. All wiring connections upon this board are made at the rear by heavy brass straps and the wiring to the board is carried in iron conduits fitted with condulets.

Lunch and retiring rooms are provided for the operating force of both sexes upon the operating room floor. These retiring rooms connect directly with the coat rooms. All of the coat lockers are of open iron work, providing for ventilation, etc.

A time-clerk's desk is located at the entrance to the operating room. Pneumatic tubes connect this room with the receiving and delivery departments. The motors operating these tubes are located in the basement. The tube system is of the compression type and the motors are in operation only when carriers are being transmitted.

Special lavatories handsomely fitted up, are located upon the sixth floor for the use of the operating department forces. The superintendent's offices face on Liberty avenue. These comprise an office for the clerical force and a private office for Superintendent Charles E. Bagley. All of the departments are provided with distilled iced water from the refrigerating plant of the building.

This plant in its entirety is typical of modern telegraph engineering, and of the policy of the Postal's management in providing the best facilities for the convenience of patrons and the prompt handling of their telegrams as well as for the comfort and welfare of its employes.

Obituary.

Thomas S. Young, a telegrapher, died at Wheeling, W. Va., on March 9, aged forty years.

Thomas E. Maddox, an old time operator, died at Washington, D. C., March 18, aged seventy-six years.

George H. Wilson, aged seventy years, an operator at Los Angeles, Cal., died in that city on March 13.

J. P. Meder, a telegrapher, aged sixty-one years, of Carson, Nev., died of pneumonia on March 1, at that place.

W. M. Oliver, of Philadelphia, aged sixty-five years, an old time telegrapher, died of heart failure in that city on March 1.

Morris B. Hockin, a broker operator at Providence, R. I., and well known as a telegrapher at other points in New England, was accidentally asphyxiated by gas on March 24.

Thomas M. Griffith, of Utica, N. Y., long since retired from business, died in that city on March 19, aged eighty-four years. In the early days of the telegraph he was a member of that profession.

Abraham C. Farley, sixty-four years of age, a telegraph operator in the employ of the Michigan Central Railroad in Kalamazoo, Mich., since the railroad was first built, almost forty-five years ago, died February 4.

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Captain John P. Manning, aged seventy-two years, an old time telegrapher, died of paralysis at Ashtabula, O., on January 21. Mr. Manning was familiarly known as the "grand old man of Ashtabula." He had been employed as an operator and general agent by the Lake Shore Railroad at Ashtabula for more than fifty years, with the exception of the time he served in the army during the Civil War.

Phoebus H. Alexander, aged sixty years, well known in electrical and telegraph circles in New York, and elsewhere throughout the country, died on March 21. Mr. Alexander was at the head of various electric and telegraph supply houses during the greater portion of his life. He was the senior member of the firm of Alexander, Barney and Chapin, a telegraph and electric supply house, and at one time and for many years was general manager of the Sawyer-Man electric Company, a branch of the Westinghouse interests.

William H. Heiss, an old time telegrapher, and at various times prominent as an official in the telegraph service, died at Sioux Falls, S. D., on March 12, aged eighty-one years. He was born at Philadelphia, July 28, 1826. Prior to the Civil War he was superintendent of the Magnetic Telegraph Company and was identified with other telegraph interests. During the war he was superintendent at Washington of the American Telegraph Company, and was active in laying submarine cables across rivers and bays adjacent to Washington in the interest of the government. In 1862 he had charge of the laying of the submarine cable across Chesapeake Bay to Black River, at which point he made a connection with Fortress Monroe. Following the war Mr. Heiss was superintendent of the American Telegraph Company at New York. Later he was associated with parties who subsequently built the lines of the International Ocean Telegraph Company through Florida, to connect with a submarine cable to Cuba, subsequently being stationed at Lake City, Fla., as superintendent. When this system was consolidated with that of the Western Union in 1873, Mr. Heiss went West where he afterward continued to reside.

Benjamin F. Woodward, a wealthy real estate dealer and owner of Denver, Colo., and an old-time telegrapher, died in Mexico, March 22. Mr. Woodward was born at Newark, O., June 25, 1834. His service in the telegraph dates from 1850, when, at sixteen years of age, he was given the position of copyist in the office of the National Telegraph Company, made up of three independent corporations, of which the late James D. Reid was superintendent of all three. From Philadelphia Mr. Woodward went to Pittsburg, at which point later he became local manager of the Western Union Telegraph Company. During the early period of the Civil War, Mr. Woodward became identified with the United States military telegraph service, doing duty at the front in Virginia. He resigned in the spring of 1863, and in the following fall engaged in the construction of a branch line from Galesburg to Denver of the Pacific Telegraph Company. On October 10 of that year Mr. Woodward opened the Denver office. A few years later he was made division superintendent of the Western Union Telegraph Company, a position he held for a number of years. Subsequently, and for a dozen years, or more, he was superintendent of telegraph of the Denver and Rio Grande Railway. Mr. Woodward organized the United States and Mexico Telegraph Company and built the line from Denver to Santa Fe, although projected to the City of Mexico. It was afterward sold to the Western Union.

DEATH OF JOHN BURRY.

John Burry, of the New York News Bureau Association, and the electrical engineer of its auxiliary, the Stock Quotation Telegraph Company, New York, was found dead in his bed on the morning of March 12, at his home at Bachmann, Rosebank, Staten Island. He had been asphyxiated accidentally by gas.

Mr. Burry was born at Freiburg, Switzerland, October 17, 1861, and came to this country in 1880. He possessed an inventive mind, practical in its workings, and in the development of his ideas was rewarded with financial success. One of his greatest practical achievements was to render the stock ticker self-winding. To Mr. Burry's inventive skill also belong the credit of introducing the storage battery as an operating force in the ticker system. Another product of Mr. Burry's inventive ability is his page-printing telegraph, which delivers its message in page form suitable for commercial or domestic use, in place of the old ticker with its messages written upon a continuous tape.

The latest application of Mr. Burry's genius was shown in the installation of his printing telegraph system, connecting the houses of Congress with the new government office building in the City of Washington, described in our issue of March 16. Mr. Burry's systems have found very general adaptation and have been installed in most of the principle cities of the United States, and in several of the larger South American cities, notably Rio Janiero and Buenos Aires, as well as in Montreal, Canada. Most of these plants were installed under the personal direction of Mr. Burry himself.

Mr. Burry was of a highly optimistic nature, had a cheery manner and had the faculty of winning friends and what is better, of holding them. He is survived by his wife and six children.

John C. Barclay, assistant general manager and electrical engineer of the Western Union Telegraph Company, in a warmly expressed tribute to the memory of Mr. Burry, declared that he represented the very highest type of telegraphic engineering ability in the special field which he so magnificently filled.

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Letters From Our Agents.

OTTAWA, GREAT NORTH WESTERN.

The staff here remains very nearly unchanged; late additions thereto include R. J. Daly, R. Martin Split and J. Taggart. At the Parliament office A. H. Hamer is the day manager, while W. Leslie is in charge at night.

An incident which provided no little amusement for the boys around the office occurred recently. One of the operators was sending press copy in which occurred the sentence: "You must answer 'yes' or 'no.'" The correspondent had inadvertently written the "no" as "know" and the sending operator wishing to be correct at any cost, refused to make the change when challenged. This caused hot words and considerable time was lost, the operator finally starting again, but unfortunately the next sentence to be sent in the report was: "Have you stopped beating your wife?" This was enough, and more, for the receiving operator. Thinking he had been insulted he named the sending operator most of the choice things an operator can think of, then refusing to copy anything further, called for the chiefs, and it took considerable time before he could be induced to believe the copy was as it had been sent.

An item which attracted quite a little interest here was contained in the letter from Dallas, Tex., in your March 1 issue, stating that Mr. McGalin was working upon a repeater which would do away with the transmitter, and could be worked without a local if desired. The reason for the interest is due to the fact that C. E. Davies, chief operator here, has had such a repeater in operation in the Ottawa office for the past six months, working as the last of four sets of repeaters in a leased wire, passing it on to Montreal as the final leg of the wire from Cincinnati. A duplicate set was also installed in Montreal for tests three months ago. So far these repeaters have given good satisfaction repeating the fastest dots without blur, due to the fact that they are "direct point break." Tests with the vibroplex failed to merge a dot.

ST. LOUIS, WESTERN UNION.

F. E. Patrick, traffic chief, Barclay department, has been appointed agent for Telegraph Age.

Superintendent George J. Frankel announces the appointment of R. J. Williams as manager at Newport, Ark., vice T. J. Copeland, assigned to duty elsewhere.

The following is a complete roster of chiefs in this office: W. E. Bellman, chief operator; H. G. Gosting, assistant chief operator, Barclay department: G. F. Stewart, F. E. Patrick, E. L. Morgan, E. W. Parmelee, Jr. Wire chiefs: A. E. Vantyne, R. L. Holden, C. L. Rayborn, L. N. Boone, E. P. Powers, E. McKnight, Miss Alma Snyder. Quadruplex chiefs: G. A. Riber, C. W. Crary, W. N. Manley, W. J. Armstrong. Division chiefs: E. L. Parmelee, Sr., M. J. Cassidy, M. J. Tulley, J. E. Dunlap, Miss Loretta Hood; traffic chief, P. A. Peterson; night chief operator, M. D. Crane; late night chief, J. Carson. Night division chiefs: Arthur Mitchell, in charge of force; E. A. Kintz, F. S. Rowe, C. Dougherty, E. H. Johnson, W. C. Petty; night repeater chief, O. R. Carson; loop chief, W. K. Kairn; late night wire chief, Charles Dubbs; timekeeper, E. S. Bowers; force clerk, Miss Nell Ruhlman; stenographer, Miss Margaret S. Coons; clerk, Miss Agnes Hickey.

The Barclay department is the busiest place in the office. Two printer wires to Chicago, one to Kansas City and two to New York, constitute the equipment.

NEW YORK, WESTERN UNION.

D. H. Christie, aged fifty-two years, died at Brooklyn, N. Y., on March 11. Mr. Christie was a member of the operating staff for the past twenty years and was well known in telegraph circles.

Theodore B. Fullon, aged sixty-two years, an old-time telegrapher, for many years in charge of one of the Phelps printers in this office, died in Brooklyn on March 14.

Frederick D. Britton, for over twenty-five years manager of several of the principal city offices of the American District Telegraph Company in New York, but of late with the Marvin Safe Company, died on March 14. For twenty years he was a non-commissioned officer of the Twenty-second Regiment Engineers, and his body was interred with military rites.

OTHER NEW YORK NEWS.

The annual meeting of the New York Telegraphers' Aid Society was held on March 25 at 195 Broadway, President W. E. Rath presiding. Business of a routine nature was transacted and the result of the election of the previous day was announced. All the officers were re-elected as follows: W. E. Rath, president; R. J. Marrin, vice-president; T. M. Brennan, treasurer; C. A. Kilfoyle, financial secretary, and W. B. Purcell, recording secretary. The following members were elected to the executive committee: Miss S. Dougherty, Miss M. E. Saunders, F. J. Sheridan, J. C. Kunkle, T. J. Smith, A. J. Gillman, W. W. Price, J. J. Reilly, D. J. Condon, E. Mesler and A. M. Lewis; auditing committee: J. H. Driscoll, F. J. Nurnberg and W. T. Rogers.

Assessment No. 476 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of Thurston A. Irvin, at El Paso, Tex.; Peter N. Uken, at Kansas City, Mo.; Robin D. Weeks, at San Francisco, Cal.; John P. Manning, at Ashtabula, O.; Philip L. Parker, at Washington, D. C., and Thomas C. Haley, at Brooklyn, N. Y.

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$1.50 a year.

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The J. H. Bunnell Company Election.

The annual meeting of J. H. Bunnell and Company, Inc., the old and well-known electrical house, manufacturers of telegraph instruments and electrical supplies, was held on March 10 at the offices of the company, 20 Park place, New York. The old board of officers was re-elected as follows: J. J. Ghegan, president and general manager; Charles E. Graham, vice-president, and Charles E. Merritt, treasurer. These gentlemen, together with Jesse H. Bunnell, constitute the board of directors.

Marconi Lectures in London.

In a lecture delivered in London, March 13, Signor Marconi told of the difficulties encountered in wireless transmission across the Atlantic. "There exist," said he, "certain periods, fortunately of short duration, when transmission is somewhat difficult. At times it is almost wholly ineffective unless an amount of energy greater than that used at normal times is employed. These periods occur in the morning and evening, when, owing to the differences of longtitude, daylight or darkness extends only part way across the Atlantic. Some times the receiving signals are weak and cease altogether. It appears to me as if illuminated space possessed for electric waves different refraction index, as compared with dark space. These waves in passing from one medium to another may be refracted and reflected in the same manner. An isolated storm area in the path of aerial signals will bring about considerable weakening. If stormy weather prevails right across the Atlantic no perceptible interference with our signals is noticed."

Book Review.

"Electrical Railroading as Applied to Steam Railways," by Sidney Alymer-Small, is a bulky volume of over nine hundred pages which has just made its appearance from the press of Frederick J. Drake and Company, Chicago. Electricity is rapidly coming into use on many lines of railway, being the motive power frequently governing operation of urban and suburban trains. Not only this, many roads are using electrically controlled block signals, and the use of automatic electric signals is rapidly increasing. While railroads employ the telegraph in train despatching, tower men and others are called upon these days to acquire a wider range of knowledge directing train movement, hence the study of applied electricity as affecting their vocation becomes a necessity to many. The style adopted in the book is that of questions and answers, and the subjects coming up for consideration cover so wide a range in their practical application as to afford a valuable encyclopedia of technical information. The book contains nearly 550 figurative illustrations, and is double indexed, one being general, the other specially considering New York Central and Pennsylvania equipments. It will be sent to any point, express charges prepaid, on receipt of price, $3.50. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

A. V. Marshall, aged seventy-five years, an old time telegrapher, died at North Fork, Ky., on March 1.

If you are a telegrapher, resident or non-resident, and desire to start a bank account where your money will be perfectly safe, and draw five per cent. interest, you can't do better than to call on or address the Serial Building Loan and Savings Institution, 195 Broadway, New York. Old conservative, sound, it can help you to buy a home.

Advertising will be accepted to appear in this column at the rate of three cents a word, estimating eight words to the line.

Will buy or sell, in one to ten share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

Rubber Telegraph Key Knobs.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

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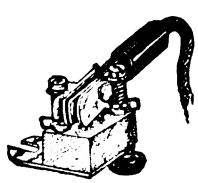
THE "HOLDFAST" RELAY SPRINGJACK.

A necessity for all users of Portable Keys and Automatic Sending Machines. Easily attached to the relay.



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THE LEFLEY KEY.

The Best Key on the Market for Business and Profit. Because it does not stick; is durable; speedy; insures fine clear-cut Morse; an easy sender.

Send draft, express or P. O. money order.

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S. M. ENGLISH, General Manager.

Operates west of the Mississippi River in Southern Missouri and Kansas, Arkansas, Oklahoma and Indian Territories, Texas and Louisiana, with outlets at New Orleans, La.; Memphis, Tenn.; Vicksburg, Miss., and Wichita, Kan., at which points it exchanges business with the

POSTAL TELEGRAPH-CABLE COMPANY
CANADIAN PACIFIC RAILWAY COMPANY
COMMERCIAL CABLE COMPANY
HALIFAX-BERMUDA AND DIRECT WEST INDIES CABLE COMPANY
NEWFOUNDLAND GOVERNMENT SYSTEM
UNITED STATES AND HAYTI CABLE COMPANY
BRITISH PACIFIC CABLES
COMMERCIAL PACIFIC CABLES
DOMINION GOVERNMENT LINES TO THE YUKON

The Great North Western Telegraph Company of Canada

H. P. DWIGHT, President.
I. McMICHAEL, Vice-Pres. and Genl. Mgr.

Head Office: TORONTO

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DIRECT CONNECTION WITH THREE ATLANTIC CABLE STATIONS.

The Great North Western Telegraph Company has a larger number of exclusive offices than any other telegraph company in Canada, and its lines reach 49,280 offices in Canada, United States and Mexico.

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Executive Offices, Montreal
JAS. KENT, Manager

The Largest Telegraph System in Canada
63454 miles of wire; 1860 offices.

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Direct Through Wires to All Parts of CANADA
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Organized 1886.

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H. A. TUTTLE, Sec'y and Gen'l Manager.
CLINTON MORRISON President.

Its lines extend through the States of Minnesota, Wisconsin, Iowa and Illinois.

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PRIMARY BATTERIES.

Edison Manufacturing Company, Orange, N. J.

TESTING INSTRUMENTS.

Weston Electrical Instrument Co., Newark, N. J.

STORAGE BATTERIES.

The Electric Storage Battery Co., Philadelphia.

TELEGRAPH AND CABLE COMPANIES.

Canadian Pacific Railway Co.'s Telegraph, E. M. Bender, purchasing agent, Montreal, Que.

Commercial Cable Co., Commercial Pacific Cable Co., German Atlantic Cable Co., W. D. Francis, purchasing agent, 14 Desbrosses St., New York.

Great North Western Telegraph Co. of Canada, Geo. D. Perry, purchasing agent, Toronto, Ont.

North American Telegraph Co., H. A. Tuttle, general manager and purchasing agent, Minneapolis, Minn.

Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

Postal Telegraph-Cable Co. of Texas, S. M. English, general manager and purchasing agent, Dallas, Tex.

Western Union Telegraph Co., Executive Offices, 195 Broadway, New York; purchasing agent, H. E. Roberts, 152 Franklin Street, New York.

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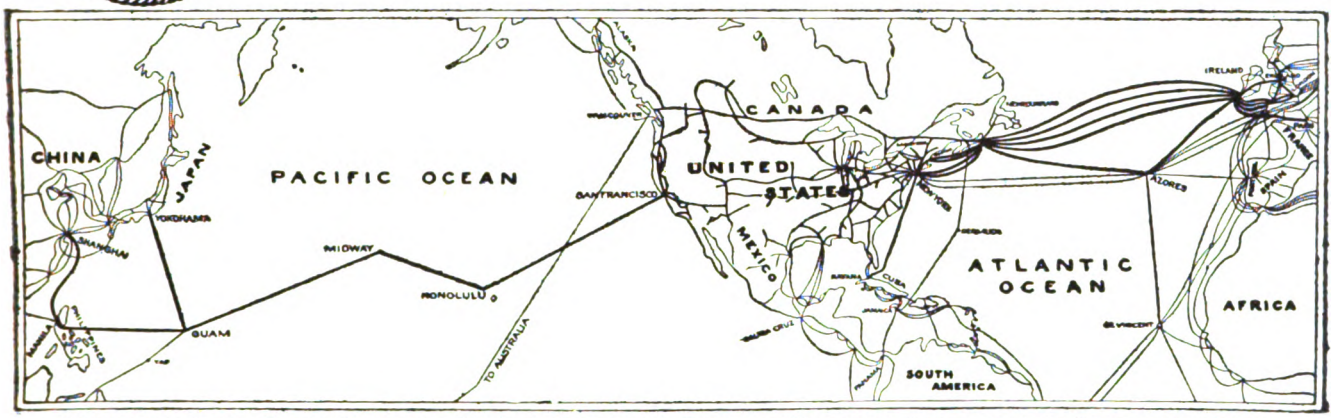

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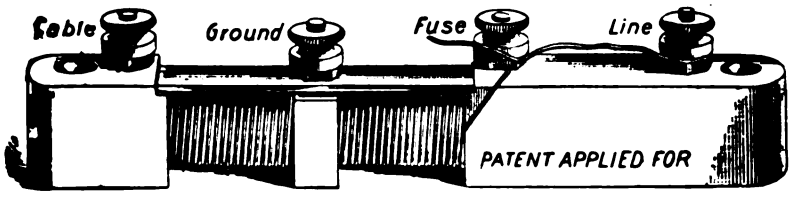

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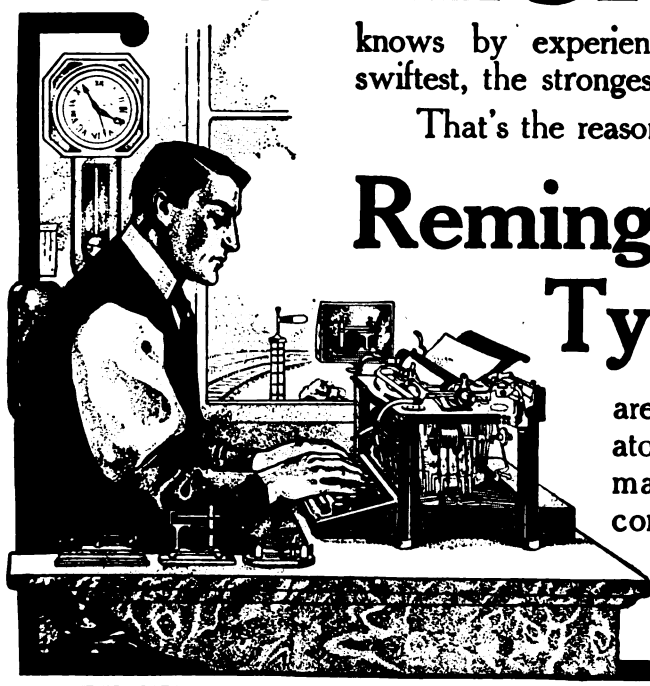

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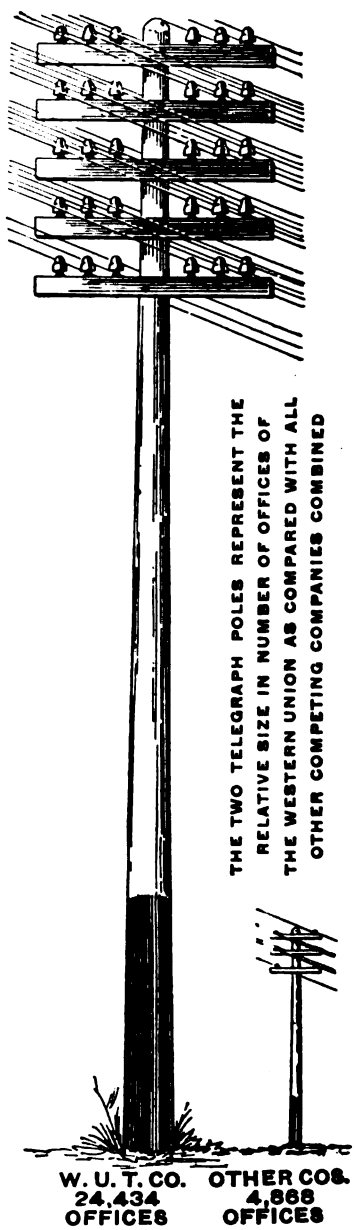

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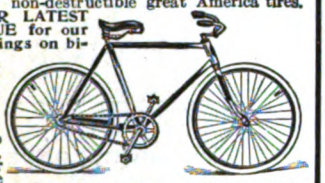

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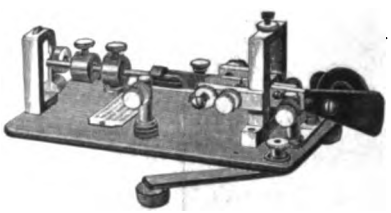

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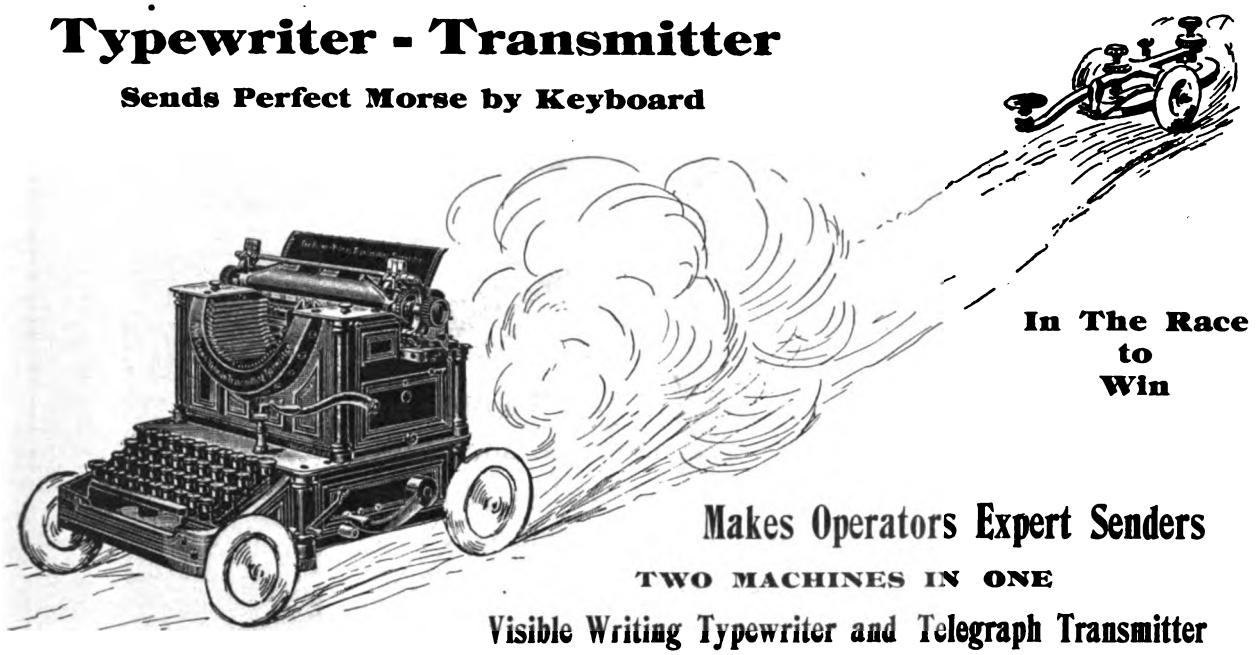

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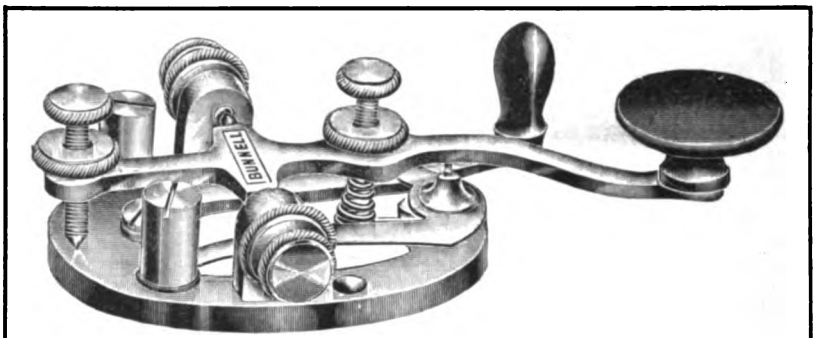

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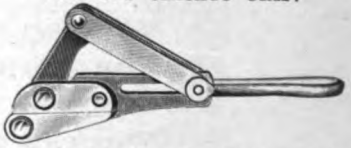

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SOME POINTS ON ELECTRICITY.

Some Things that do not Occur in an Electric Circuit.

BY WILLIS H. JONES.

In the acquirement of knowledge of a given subject or the operation of apparatus students are usually somewhat retarded in reaching a correct understanding thereof owing to erroneous first impressions, which must be cleared away before actual progress begins.

Thus the common understanding of duplex operation by the unenlightened is that the two messages in opposite directions actually pass each other on the wire, and that each letter or signal comes from, and is due to the arriving current originating at the sending station. As it usually requires a great deal of study to get this idea eliminated from the mind, it is sometimes quite as important when explaining a subject to state what does not occur as it is to mention the legitimate functions of a device.

The student should understand in the beginning that two electric currents cannot possibly occupy a conductor at the same instant. An electric current represents energy exerted in a certain direction. The two polarities of current represent energy exerted in opposite directions. The actual volume of current which flows through a conductor at a given instant represents the effective energy creating it. In a wire possessing, say, one hundred ohms and one ampere of current the effective energy must be due to the pressure of one hundred volts exerted in one direction, but it might be due to the difference between oppositely directed pressures. Thus two hundred volts positive at one terminal and one hundred volts positive at the other, would give the same current volume as one hundred volts alone of either polarity unopposed. It should now be plain that although opposing electrical pressures may be simultaneously impressed, it is impossible for two currents of electricity tending to flow in opposite directions to actually use the same conveyance at the same instant.

The same law controls the magnetic lines of force which surround every conductor carrying a current of electricity. We may cause two currents of opposite polarity to traverse two coils of wire wound around a common iron core, such as the magnet core of a differentially wound relay used on multiplex circuits, or send two currents of like polarity around it in different directions because in this case we have two conductors to carry them, but so far as their capacities for creating magnetism in the relay core is concerned the two currents are now in the same position as the electromotive forces mentioned in the first case; that is to say, the two currents can now act simultaneously, but the output, represented by the amount of magnetism they create in the iron core, depends entirely upon whether the said currents aid or oppose each other in developing magnetism. In other words, whether or not the two electric currents create magnetic lines of force which flow through the iron in the same direction. If equal volumes of current oppose, no magnetism is developed; if unequal, the magnetic strength will be in proportion to the strength of current representing their differences. The student is, of course, supposed to already know that the current alone is the father of magnetism, as electromotive force is the creator of current.

From these general remarks it will be seen that although no current can flow through a wire when electromotive forces of equal pressure oppose each other at the two terminals of the circuit; or two currents of opposite polarity occupy the same conductor at the same instant; or magnetism be developed in a relay by two equal opposing currents; the equivalent of doing so is obtained by creating a difference between the respective strength of the opposing forces and thus being able to send and receive a message over one wire at the same time.

This end is attained by means of an artificial line consisting of a rheostat through which the

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home current constantly flows. As one coil of the differential relay is in series with this latter circuit it follows that there can be no time when the home relay is not supplied with a current although the companion coil and main line current may be entirely shut off when the main line batteries oppose one another. The presence of the current in the artificial line is thus constantly on the alert to create magnetism in the home relay the moment the main line current fails, and as the relay coil in this artificial line is so "set," or wound, as to be continually trying to make the same signal that the distant station is making, but cannot do so when current flows through the line, the moment the main line current is shut off the home current gets a chance to magnetize the home relay and thus performs the identical service that the distant battery would have done had its current been able to get through the line.

At such times it is apparent that each station must actually be in the act of making the same signal, say a dash, the closing of their respective keys at the same instant causing the line batteries to oppose each other. Hence, under these circumstances, each home current creates a dash on the home relay and each operator hears what to him is apparently the effect of an incoming current. In all methods of multiplex operation the apparent passing of signals in opposite direction through a common conductor is accomplished either in the manner described or by allotting each transmitting station a separate but fractional period of time, during which period each have in turn the sole control of the wire.

Another erroneous impression, quite common, is that an alternating current creates no magnetism in the core of a relay. This impression is no doubt due to the fact that a single line relay or sounder connected in a circuit fed by an alternating current will show no evidence of magnetism as the lever or armature invariably stands "open."

If any one is still in doubt concerning this question let him connect a polarized relay in an alternating current circuit and adjust the local contact points closely. He will then discover that the armature lever will follow every reversal as faithfully as though actuated by the alterations in the direction of current in an ordinary duplex circuit. Its successful operation will only be limited by its mechanical inertia.

An electro-magnet of the single line relay or sounder type, however, will not show the presence of magnetism because the reversals of polarity at the ends of the iron core are so rapid that for all practical purposes we get simultaneously both positive and negative at each end. This, of course, practically demagnetizes the iron so far as its usefulness as an attractive device is concerned, and the armature consequently remains "open."

With a direct current one pole of the magnet is positive and the other negative at all times and in addition to getting a sustained magnetizing force while the current is flowing, we also get the benefit of two poles pulling together, hence the armature responds promptly.

Recent Telegraph Patents.

A patent, No. 882,347, for a composite signaling and telephone system, has been granted to Harry O. Rugh, of Sandwich, Ill. A combined telegraph and telephone system has a quadrilateral of connections at each station, the telephone receiver circuit being connected to opposite points of the bridge so formed, and the telegraph apparatus being connected in series with the line.

A patent, No. 882,649, for a cable-laying machine, has been granted to George W. Noble, of Collbran, Colo. A combination of a cable-laying plow and means for paying out the cable.

A patent, No. 882,835, for a device for attaching cross-arms to telegraph poles, has been issued to John E. McGillivray, of Walla Walla, Wash. The device consists of a body part and a shelf and lug made of sheet metal, the lug and shelf being cut one from the other, and the shelf struck up at right angles to the lug and body part.

A patent, No. 882,850, for a lineman's portable telegraph pole seat, has been awarded to Charles T. Troell, of Seguin, Texas. Clamp bars automatically secure the seat to the pole.

A patent, No. 883,062, for a strain relieving attachment for telegraph keys, has been taken out by W. H. Teachworth, of Waxahachie, Texas. An attachment for telegraph keys comprising a vibratory arm, a releasing member therefor, a contact adapted to be engaged by said arm, a shiftable key member, and an adjustable connection between the key member and said releasing member for operating the latter when the key member is shifted.

A patent, No. 883,530, for a telegraph repeater, has been obtained by Stephen D. Field, of Stockbridge, Mass. A telegraph repeater designed to overcome a characteristic defect of repeaters now in use, namely, the clipping or mutilation of the signals due to the sluggishness of the repeater receiving sounders. Provides a system by which the repeating sounders are caused to be no more strongly energized by telegraph signal dashes than by the dots, so that the armature moves off of the contact with equal promptness in any case. Provides a number of other features, among them a magnetic shunt which exerts a "kick back," so that a very slight retractile spring is sufficient. Also has a self-regulating maintaining shunt around the local contacts of the line relay which insures only a very light holding force of the relay on its armature.

The following patents have expired:

Patent No. 448,779, for telegraph, held by T. A. Edison, of Menlo Park, N. J.

Patent No. 449,174, for a telegraph transmitter, held by H. G. Robbins, of Minneapolis, Minn.

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Personal.

Emilio Ortuno has been named director-general of posts and telegraphs of Spain, replacing Marquis de Valtierra, resigned.

M. Barbarat, inspector-general, has been promoted to the office of director of posts and telegraphs at Tunis, Africa, replacing M. Mazoyer, promoted to the position of secretary of posts and telegraphs at Paris.

Mr. Charles A. Tinker, of Brooklyn, formerly general superintendent of the Eastern division of the Western Union Telegraph Company, is recovering from a severe attack of pneumonia, which has caused him to pass through a prolonged and critical illness.

Mr. Donald McNicol, manager of the Postal Telegraph-Cable Company at Salt Lake City, Utah, and who is secretary of the Utah Society of Engineers, which will hold its annual banquet on the evening of April 21, will serve as the chairman of the dinner committee on that occasion.

Frank L. Catlin, of New York, son of Fred Catlin, and like his father a telegrapher of great ability, who has frequently demonstrated his power in this respect at tournaments, etc., has returned to New York from Florida, where he has spent the winter in company with his wife and young son.

Mr. Frank C. Mason, a well known old-time telegrapher, formerly and for twenty years superintendent of police telegraph in the Borough of Brooklyn, New York, who has been passing the winter in town, returned last week to his home at Glen Alex Farm, near Utica, N. Y., where he will remain until another winter will cause his return to the city.

Mr. Ernest W. Emery, of Washington, D. C., a well-known telegrapher, for the past ten years wire chief for the Southern division of The Associated Press, has been appointed day manager in that city, succeeding E. M. Hood, recently promoted to be assistant superintendent of the Southern division. Mr. Emery is a member of the Order of Elks, and was lately elected exalted ruler of Washington Lodge No. 15 of the capital city.

Mr. James E. Pettit, of Chicago, secretary of the Society of the United States Military Telegraph Corps, and who is the chief operator of the Postal Telegraph-Cable Company at that place, is seriously ill at his home, suffering from an attack of Bright's disease. Because of his illness and consequent inability to act in his official capacity, Col. A. W. B. Wilson, president of the corps, has appointed David Homer Bates, of New York, secretary pro tem in Mr. Pettit's stead.

Mr. Bernard E. Sunny, vice-president and western manager at Chicago, of the General Electric Company of Schenectady, N. Y., and formerly well-known telegrapher, has resigned his positions to take effect May 1 in order to accept a vice-presidency of the American Telephone and Telegraph Company to which he has been elected. Mr. Sunny will continue to reside in Chicago, from which point he will be in a better position to direct the affairs of the telephone company in the West. He will, however, retain his connection with the General Electric Company, although withdrawing from all active service therewith. It will be remembered that prior to 1888, and covering a period of about ten years, Mr. Sunny was superintendent of the Chicago Telephone Company, an office he filled with marked ability and was highly successful in promoting the affairs of that corporation.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Col. R. C. Clowry, president and general manager of the company; B. Brooks, general Eastern superintendent; J. Merrihew, formerly general superintendent of the Southern division; Rush Taggart, solicitor of the company, and D. H. Louderback were in Boston recently for several days, on business connected with the old litigation with the American Telephone and Telegraph Company, a matter which is now nearing final adjustment.

A readjustment of territory growing out of a new contract with the Erie Railway Company, has resulted in a few of the larger offices located at points along the eastern portion of that system of railway being transferred to exclusively Western Union districts.

A. G. Saylor, assistant general superintendent of the Eastern division, recently visited many different points within his jurisdiction, his trip being undertaken on company business.

Theodore P. Cook, general superintendent at Chicago, accompanied by M. T. Cook, his private secretary, was a visitor at this office on April 8 and 9, coming on business connected with the service.

Mr. H. L. Waterbury, manager at Saratoga Springs, N. Y., was recently elected president of the Chamber of Commerce of that place.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Grant T. Yetman, superintendent of the Boston District Messenger Company, is in New York and will remain here for a few weeks, his business being in connection with the messenger service of this company.

Mr. R. H. Hawkins, manager of the office at Albuquerque, N. M., is absent on a two-months' vacation in Missouri, and P. A. Angus, formerly chief operator at El Paso, Tex., is temporarily filling his place as acting manager.

RESIGNATIONS AND APPOINTMENTS.

E. H. Wickelman, manager of the office at Clinton, Iowa, has been appointed manager of the Davenport, Iowa, office, vice H. E. Beeson, resigned on account of ill health.

J. D. McLelland has been appointed manager at Shreveport, La., vice I. D. Hough, resigned.

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Chase Laurendine, night chief operator of the Mobile, Ala., office, has been appointed manager of the office at Gulfport, Miss.

Samuel D. Howard, chief operator at Lexington, Ky., has been appointed manager at that place, vice J. C. Williams, resigned. Mr. Raymond G. Anderson has been appointed to fill the vacancy caused by the promotion of Mr. Howard.

Radio-Telegraphy.

The Ottoman government is taking steps to develop communication by means of wireless telegraphy in the Arabian Peninsula, especially in the Provinces of Hedjaz and Yemen.

The wireless telegraph station has been completed at the Masso, Havana, Cuba. A new station has also been constructed at Santa Clara, and stations are in course of construction at Camaguey and Santiago de Cuba, that island.

The British admiralty has now eleven wireless stations on the British coast and three more will be installed during the present year. Together with war signal stations there are now one hundred and sixty-seven stations in the United Kingdom from which communications can be made to and received from war vessels. A station is now being installed at the Admiralty building in Whitehall, London, for the purpose of keeping the naval authorities in touch with naval ports and the home fleet.

An automobile equipped with a wireless telegraph apparatus was recently shown at a Brussels exhibition, and although the tall mast fitted on top of the limousine would doubtless be an unsurmountable inconvenience to touring, such an equipment is now being used in army operations and is found to be satisfactory. A number of armored automobiles thus equipped, and placed with the different divisions of a warring army, would, it is said, make the transmission of orders vastly superior to the ordinary field telegraph service.

The reports current of late to the effect that the Marconi Wireless Telegraph Company and the United Wireless Telegraph Company are considering plans of consolidation have been denied by officers of both companies. Three bills regulating the wireless service are at present pending before Congress, all of which are considered by the wireless companies to be inimical in their present form to wireless interests, and the fact that representatives from both companies have been at Washington looking after their company's affairs is suggested as the cause of the report that plans of consolidation were on foot.

An evidence of the rapid development of wireless telegraphy and of its very general installation on shipboard as a portion of modern marine equipment, is witnessed in the great number of wireless operators constantly to be met with in New York. At this port the great transatlantic liners running to all parts of the world, as well as coasting vessels, find a terminal. As many of these steamers carry one or two operators each, there are at no time probably less than from fifty to sixty such operators present in this city. As a rule, these men are among the most intelligent of the fraternity, and reflect credit to the profession of which they are members. It is to be observed that those coming from abroad frequently represent the best type of the foreign expert operator, no matter what their nativity. Among those of this class visiting New York recently was Mr. H. Poulsen, who is attached to the steamship Estoria, plying between this port and Libau, Russia, a tall young fellow typical of the stalwart race to which he belongs.

During his recent visit to German East Africa, Herr Dernberg, the German secretary of state, came to the conclusion that in consequence of its cheapness as compared with landlines through an impracticable country, wireless telegraphy comes first into consideration for such districts. After the recent performance between the Nauen station and Teneriffe, it is claimed that the bridging over of a distance of 2,480 miles could be effected with moderate funds, but the principal task is the institution of a direct connection between Germany and her colonies. During the late campaign in Southwest Africa, experience with the military stations used showed that wireless telegraphy was absolutely necessary as a means of transmitting information, and it is considered that the success eventually attained could scarcely have been accomplished without the system. At the end of 1903 six stations were in operation, the principal one being at Keetmannhoop, and the remainder in a radius of from ninety-three to one hundred and twenty-four miles. The main difficulties encountered in connection with the stations, which were originally constructed for German conditions, were in the provision of hydrogen for the balloon which supported the aerial wires, and the supply of benzine needed for driving the motor. The station itself was arranged on a tolerably heavy wagon, and it had, therefore, to overcome the greatest difficulties in penetrating the underwood, and in actions in the mountains. These obstacles have given the incentive to the perfecting of military stations in Germany, and rendered necessary the construction of specially light, portable stations, in which working materials, such as benzine, lubricating oil, etc., are no longer requisite. A station of this kind, which has just been inspected by the secretary of state, consists of a transmitting and receiving apparatus, a light metallic mast, and a bicycle under-frame for driving the generator, the total weight being four hundred pounds. The whole station can be divided into four loads for horses or mules, or into eight loads for men. It is stated that the range of the station amounts to sixty-two miles, and it can be erected in a quarter of an hour.

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The Cable.

Cable communication is interrupted April 14 with:

Venezuela	Jan. 12, 1906
Hayti	Jan. 18, 1908
All offices closed to international traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.	
Madura Island (Dutch East Indies)	Feb. 3, 1908
Sitka-Valdez cable interrupted	Mar. 21, 1908

The civil service estimates for England for cable subsidies for the year ending March 31, 1909, says the Electrical Review of London, have just been issued, and make provision under the heading of "Telegraph Subsidies and Pacific Cable" for the payment of £4,500 to the Eastern Telegraph Company; £35,875 to the Eastern and South African Telegraph Company; £4,000 to the Eastern Extension Company; £8,100 to the Halifax and Bermudas Cable Company, and £8,000 to the Direct West India Cable Company, while a sum of £62,500 has been ear-marked for the Pacific cable. After deducting appropriations in aid, there is a sum of £67,133 to be provided. The appropriations in aid are sums payable by various colonies, such as Canada, the Australian Commonwealth, New Zealand, Mauritius and Seychelles, towards the cost and maintenance of cables .

THE INTERNATIONAL TELEGRAPH CONFERENCE.

A concerted movement by states of Central and South America to secure at the International Telegraph Conference in Lisbon, Portugal, beginning May 4, an abrogation of the present system of coding and a return to the old rule limiting code words to bona-fide words taken from seven European languages, has caused a great stir among merchants and bankers of New York, who do much business by cable. A petition has been forwarded to Secretary Oscar S. Straus, of the Department of Commerce and Labor, urging that a representative to the coming International Telegraph Conference be appointed to protect the commercial interests of America.

The question of appointing such a special representative will receive governmental consideration, although it has been understood that the Hon. Charles Page Bryan, the United States Minister to Portugal, would be the only representative of this government present at the Conference, no one especially appearing in behalf of the Signal Service, as heretofore.

As has been previously announced, George G. Ward, vice-president and general manager of the Commercial Cable Company, New York, will be present at the Conference to represent his company's interest, and T. W. Goulding, of London, the European general manager of the Western Union Telegraph Company, will be in attendance to represent that company and its allied interests. We are advised by Camilio A. Gonzalez, director-general of the federal telegraphs of Mexico, that that country will not be represented at the Lisbon Conference.

The Municipal Electricians.

A patent, No. 883,665, for a combined police call, fire alarm and watchman's box, has been granted to J. G. Nolen, of Chicago. A manually operated signal transmitting box, capable of use as a police call box, as a fire-alarm box, and also as a watchman's box.

A patent, No. 882,250, for a fire alarm box, has been taken out by M. W. Hamblin, of Milwaukee, Wis., now of New York. Fire alarm box of the type designed to be placed in buildings, and from which an alarm is sent to a main receiving station. Comprises a box adapted to serve both as an alarm box and as a watchman's receiving box.

A patent, No. 883,226, for a fire alarm and signalling system, has been obtained by John D. Nolen, of Toledo, Ohio. Fire-alarm and watchman's signaling system, including a normally wound box so constructed as to be available at all times for use in sending in a fire alarm, and adapted to be manipulated by a watchman in reporting his rounds without sending in a fire alarm.

A patent, No. 881,663, for a fire alarm, has been awarded to George H. Carroll, of Vacaville, Cal. This apparatus consists of a circuit closer, a tension device and a fusible cord connecting the two, the circuit closer comprising a slide and a contact piece in the path thereof, each forming portions of an alarm circuit. The tension device is a spring-wound drum, to which one end of the fusible cord is connected and upon which it is wound.

A patent, No. 880,521, for a fire alarm, has been granted to William Glenck, of Newark, N.J. Particular construction of circuit closer for a fire alarm, making use of a celluloid cap, which is destroyed by fire to release a spring.

A patent, No. 880,662, for an automatic electric fire alarm signal, has been issued to Edward E. Hayden, of Washington, D.C. A circuit closer, having substantially the form of a push button, and including a coil of compound metals which expands when heated to depress the push button.

The proceedings of the twelfth annual convention of the International Association of Municipal Electricians, which met at Norfolk, Va., on July 7, 8 and 9, 1907, has just made its appearance. It is compiled with the usual care that characterizes all of the work of this nature performed by Frank P. Foster, of Corning, N. Y., the secretary of the association, the whole presenting a faithful verbatim report exceptionally well treated, of all that transpired on the occasion in question. The various papers read at the meeting are printed, together with the discussions which followed. Then the reports of the several committes are given, also with the accompanying discussions. The pages of the volume, which number 120, are further enlivened by well-executed engravings of the officers and members of the executive committee, and it is a book that the entire individual membership will value, and the receipt of which will be welcomed. The next convention, that for the current year, will be held at Detroit, Mich., at a date yet to be announced.

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Obituary.

W. H. Jones, aged fifty-four years, an operator in the employ of the Western Union Telegraph Company at Columbus, O., died of apoplexy March 21.

First Lieut. David A. Lindsay, U. S. A., Signal Corps, shot and killed himself at San Francisco, April 8. He was a native of Pennsylvania and was thirty-three years of age.

Captain Julien P. Wooten, aged fifty years, who served with distinction as an officer of the Volunteer Signal Corps, United States Army, in the war with Spain, died at Washington, D. C., April 10.

Langdon Smith, better know as "Denver" Smith, formerly a prominent telegrapher, but for twenty-five years past a well-known newspaper correspondent and editorial writer, died at his home in Brooklyn, April 8, aged fifty years.

William O. Callender, the founder of Callender's Cable and Construction Company, Ltd., London, and well known in the United States, died at Bournemouth, England, on March 14, aged eighty-one years.

Edmund W. Firman, a telegrapher well known in Washington and New York, died in the latter city on March 28, aged sixty-seven years. His last place of employment was at the Central Cable Office, 16 Broad street, New York.

H. Baker, retired, for many years superintendent of the telegraph department of the Birmingham post office, England, died March 24. He served under the Electric and International Telegraph Company, prior to that company's business being taken over by the British government in 1870.

Captain R. J. Fowler, a resident of Memphis, Tenn., died March 24 at Wynne, Ark. Captain Fowler was at one time superintendent of the Postal Telegraph-Cable Company at Birmingham. For the past five years he had worked with the company at Memphis as an operator and was well known there.

William Ainsley Kreidler, founder and principal owner of the Western Electrician, Chicago, died at Augusta, Ga., on March 26, aged forty-nine years. He was a man of fine literary tastes, of business ability, and the paper, which he started in 1887, under his management has achieved a notable success. The publication of this journal will be continued without change.

A. H. Babb, aged fifty-nine years, a former well-known and expert telegrapher, died at his home in Cataraugus, N. Y., April 1. He left the telegraph service about twenty years ago, to engage in the grain trade, which he afterward and for sixteen years successfully conducted at Peoria, Ill., retiring therefrom about two months ago on account of ill health. His telegraphic career was a brilliant one, and he was employed in New York, Chicago and other large offices, ranking among the best of operators. He was a prominent Mason and a Mystic Shriner. He never married.

Joseph Howard, Jr., a well known journalist of New York, died on March 31, aged seventy-four years. Mr. Howard will be remembered by telegraphers more especially as the author of the bogus Presidential proclamation during the Civil War, which called for 400,000 additional volunteers, the issuance of which caused the government to seize the Inland Telegraph Company charged with being instrumental in transmitting the supposed message, and marshalling under arrest a number of its officers and men at New York, Washington and other points, in the belief that they were in some occult manner contributory to the fraud.

The Atlantic Telegraph Company.

The Atlantic Telegraph Company operates a line of telegraph from Boston to Portland, Me., with offices, intermediate, at Lowell, Lawrence and Haverhill, in Massachusetts; Exeter, Portsmouth and Dover, in New Hampshire; Biddeford, Old Orchard and Portland, in Maine. It is a four-wire line from Boston to Lowell, and a three-wire line thence to Portland. The short wire from Boston to Lowell, and another wire from Boston to Portland have been leased to brokers, leaving for the company's use two local wires from Boston to Portland for local business, and these are kept reasonably busy. Robert Morton, formerly and for many years of New York, is the general manager of this system, with headquarters at Lowell. Dr. S. C. Gordon, of Portland, is the president of the company, and John J. Hogan, of Lowell, is the treasurer.

The Telegraph in Egypt.

Telegraphic communication in Egypt has greatly increased in recent years; the number of messages despatched in 1906 amounted to 2,300,000, as against 2,000,000 in the previous year. The number of offices was slightly larger, but advance in this direction is hindered owing to the lack of capable operators. In addition to the government telegraph service, there is in Egypt an English cable company which has offices in Cairo, Alexandria and Port Said, and plays an important part in the transmission of messages between Egypt and the chief European countries.

Target practice of the kind that sometimes finds expression in the Dakotas, proved to be too much for the nervous susceptibilities of a railroad night operator, causing his resignation and return East. He had had several adventures with would-be "bad men," and the one that wound up his experience occurred the other night. He was carrying two lanterns for the block signals when two shots rang out and both lights disappeared. While he was not injured, he considered that the shock to his nerves was sufficient to call for a vacation.

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The Railroad.

G. C. Todd, trainmaster of the Buffalo division of the New York, Chicago and St. Louis Railroad, has been appointed joint superintendent of telegraph of the New York, Chicago and St. Louis and the Western Union Telegraph Company, with headquarters at Cleveland, Ohio, succeeding R. W. Mitchener, promoted.

In reference to the notice of the fact published in this column on April 1 that train despatching on the division of the Illinois Central Railroad between Kankakee and Chicago was being conducted by telephone, Mr. E. Parsons, assistant superintendent of telegraph of that road, writes: "This is largely a matter of experiment up to the present time, however. So far it has proven an entire success and unless something unforeseen occurs, we expect within a short time to operate trains on a large part of our signal track by the use of telephone instead of the telegraph."

Apropos to the convention of the Railway Telegraph Superintendents, to be held at Montreal, Que., on June 24, 25, 26 and 27, respecting which a lengthy reference appeared in the issue of April 1, it is pertinent to state that if those who attend and who make the side trip to Quebec, wish to remain over night, or indeed to spend a few days in that ancient city, so full of quaint interest to the visitor, it will be well if immmediate application for rooms be made, preferably, as Mr. Camp suggests, at the Chateau Frontenac, as the hotels in that old French town are apt to be crowded at the time of year the convention meets, possibly making the obtaining of sleeping accommodations if deferred until that time quite difficult.

Ignoring the Wisconsin state law, which requires that no telegraph operator engaged in the handling of trains shall work more than eight hours in any consecutive twenty-four hours, one of the railroads of that state has begun working operators nine hours, in compliance with federal law. Since the new United States law regulating the hours of service of all trainmen and operators went into effect, March 4, there has been a question as to whether the state law for operators would take precedence over the federal law, or whether the United States law would supersede the state law. The railroads have expected to take the matter into the courts for a decision, but no action has as yet been started, so far as we can learn, whether in Wisconsin or any other state where eight-hour laws prevail.

It is announced that the Lake Shore and Michigan Southern Railroad Company will operate trains between Erie and Buffalo, a distance of 88 miles, by telephone. It is expected that the change will be brought about within a short time and that if all works well the telephone system will be extended from Erie to Cleveland. J. J. Bernet, general superintendent of the company, states that the change will be made on the main line just as soon as it is possible to install the necessary apparatus. A. S. Ingalls, the assistant general superintendent of the Lake Shore, is now in Albany figuring on the immediate construction of the equipment. The decision to supersede the telegraph with the telephone on the main line of the Lake Shore is the direct result of the very successful experiments conducted on the Lake Erie, Alliance and Wheeling branches during the past five months; likewise on the New York Central out of Albany. The system has worked so very smoothly that the telephone has gained great favor among officials of the entire Vanderbilt system, as well as throughout the country generally.

Reference has been previously made to a combination of telegraph and telephone working on two duplex wires of the Canadian Pacific Railway system, between Montreal and Winnipeg. The telephone service of this combination has since been extended and the present arrangement embraces the following: There are two two hundred and ten-pound copper wires between Montreal and Winnipeg, each duplexed, with repeaters at Fort William, a distance of 995 miles. On these two wires is worked a telephone circuit from Montreal to North Bay, 360 miles, and another independent telephone circuit from North Bay to White River, 384 miles. The Montreal-North Bay telephone circuit has been in use for over a year, but the company was unable to add the section from North Bay to White River until the services of Messrs. R. E. Chetwood and W. E. Athearn, of the American Telephone and Telegraph Company, New York, were brought into requisition, when the problem was solved.

There had never been any difficulty in getting the telephone circuit to work, but previously it was found impossible to avoid interfering with the working of the duplexes.

The question of train despatching by telephone is engaging the attention of the Canadian Pacific Railway Company. Recently W. J. Camp, of Montreal, electrical engineer of the telegraph system of that road, through the courtesy of W. W. Ryder, of Chicago, superintendent of telegraph of the Chicago, Burlington and Quincy Railroad, made a close study of the mode of despatching trains by telephone in vogue on that line. So impressed was Mr. Camp with the utility of the method employed that he submitted a report of the same highly favorable to its adoption on the Canadian road. This has been supplemented by a report of like character rendered by George Rook, of Montreal, inspector of train despatching of the Canadian Pacific. As a result the vice-president of the road has ordered a specimen, or trial, circuit to be equipped between Montreal, Outremont and Farnham, a distance of forty-nine miles of single track road. Work has already been commenced of stringing two two hundred and ten-pound copper wires along this section, and if the experiment proves successful it is proposed to extend this equipment extensively on other portions of the Canadian Pacific system. It is expected that this circuit will be in working order by the time the Superintendents meet at Montreal in June next.

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Legal.

The Supreme Court of Texas, Judge Calhoun, has decided against the Western Union Telegraph Company in a suit brought against that corporation by the state to enjoin it from doing business in Texas on the ground that it has no permit to so operate. The permit would cost $100,040 under the Texas laws, as the corporation has a capital stock of $100,000,000.

The Western Union denied liability for the tax on the ground that it is a Federal agency under an act of Congress, as its lines come under the act providing for the use of military post roads, lines, etc. Also that it does not owe the State of Texas a tax based on the entire capital stock of the company because the entire capital stock is not employed in Texas, but only a small part of it, therefore the measure of the correct tax is an apportionment to that state based on the wire mileage therein.

While this decision prohibits interstate business of the telegraph, it does not effect the transmission of Federal interstate messages.

Business Notice.

On page v. of this issue appears an advertisement of the Sandwich Electric Company, of Sandwich, Ill., the same being embellished with an illustration showing the station telegraphone manufactured by this company, the invention of Harry O. Rugh. This ingenious instrument, utilizing the howler call device which has always given the best of satisfaction, is one of the most commercially satisfactory composite telephonic instruments, and is rapidly coming into favor among the railroads, already being extensively used on various systems in this country and Mexico. Railroad telegraph superintendents, train despatchers and others will be especially interested in this instrument, and the company will be glad to furnish any desired information respecting the same and invites correspondence in connection therewith. It will be remembered that the device was shown in interesting exhibit last year at the Atlantic City, N. J., convention of the Railway Telegraph Superintendents.

This company has recently put a telephone selector upon the market, which, working in conjunction with telephones, offers a very satisfactory and practical means for despatching trains by telephone. This device has been put to practical operation upon a very prominent railway system, and results obtained are highly satisfactory.

The selector is designed to operate upon either single or metallic circuits.

Mr. Robert Morrell, superintendent of the West India and Panama Telegraph Company, at St. Thomas, Danish West Indies, in renewing his subscription to Telegraph Age, writes: "I find your paper a most excellent one for general telegraphic information, and it is of the greatest interest to me."

The Hulit Selector.

In the descriptive reference to the Hulit selector published in the issue of April 1, the statement was made that the answer back signal in this device is accomplished at the same time the switch on the selector is restored. This is an error, a correct reading of which would be that the answer back signal is executed instantly the signal reaches the selector, and is done automatically, thereby notifying the office from which the signal was transmitted almost immediately when the signal has been received O. K.

The Dean Rapid Telegraph Company.

Robert L. Dean, president and electrical engineer, and G. E. Gleason, first vice-president, of the Dean Rapid Telegraph Company, of Kansas City, Mo., were in New York a few days since. Mr. Dean reports that his system which is in operation between Kansas City and St. Louis, is gaining in public estimate and commercial use. The tariff charges between the two points named are at the rate of one cent a word, with a minimum charge of twenty cents, such messages being delivered by the company's special messenger service. What are termed "lettergrams" are charged for at the rate of one-half cent a word, with a minimum charge of fifteen cents, the message being delivered by United States mail.

The Electrical Aid Society of Philadelphia.

The Electrical Aid Society, of Philadelphia, will hold its eighth annual reception on Tuesday, April 28. The demand for tickets has been so large that the big Mercantile Hall has been engaged for the occasion, and the affair promises to be a brilliant one. There will be covers laid for seven hundred guests at the banquet. The society embraces within its membership, which now numbers seven hundred and fifty, those engaged in the telegraph, the telephone and in the municipal electrical bureau service in the city of Philadelphia. Its financial condition is in excellent shape, the treasury surplus amounting to over $5,000. A. S. Weir is president.

New Stock Quotation Telegraph Building.

Plans have been filed for the new eighteen-story office building to be erected for the Stock Quotation Telegraph Company, diagonally opposite the new Consolidated Exchange at 26 to 28 Beaver street, running through to Marketfield street, New York, part of which site is occupied by its present offices. The building will be 220 feet high, with a frontage of 53.5 feet on Beaver street and with a full depth of 56.2 feet. The edifice is to cost $250,000. Morgan M. O'Brien is the architect.

Two of the Atlantic cables were broken in New York Harbor off Quarantine on Saturday, April 11, being picked up by the anchor of the French line steamer Lorraine.

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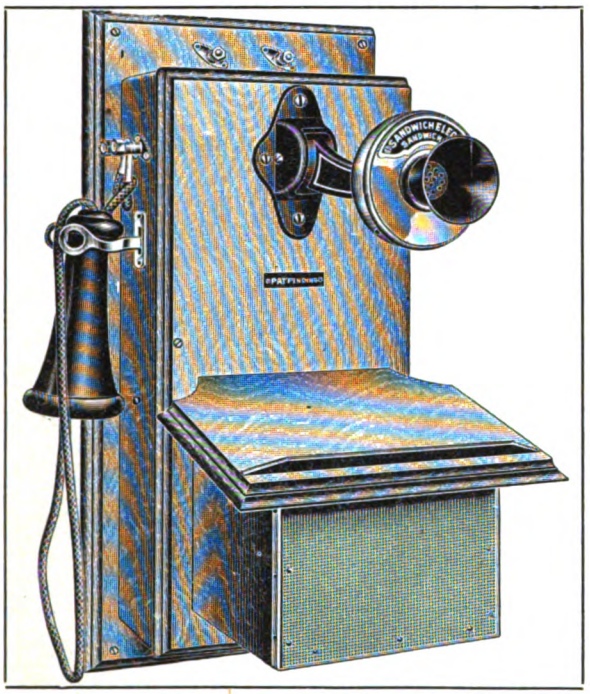
Railway Composite Apparatus



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Calls can be made individually, consecutively or in groups.

SANDWICH ELECTRIC COMPANY

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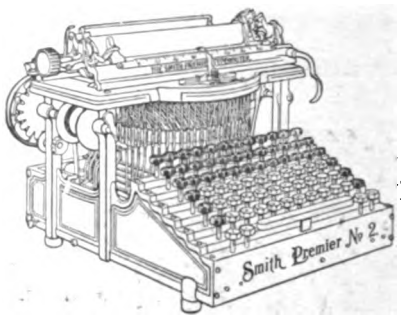
TO A
Smith Premier Typewriter



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The Telegraph Chronicle

is the only telegraph newspaper published in England. All who wish to know what is going on in the British Postal Telegraph Service and to keep abreast of the progress of technical improvements in telegraphic apparatus and methods, should subscribe to the

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REMITTANCES to Telegraph Age should be made invariably by draft on New York, postal or express money-order, and never by cash loosely enclosed in an envelope. By the latter method money is liable to be lost, and if so remitted is at the risk of the sender.

NEW YORK, APRIL 16, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we have sometimes in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum named or even more. The growing value of complete files of Telegraph Age should cause our readers to carefully preserve their issues.

It will be welcome information to many of our readers to know that Telegraph Age has in course of preparation for early publication a very full, accurate and comprehensive article treating on the Barclay printer. As the fame of this machine following its extensive introduction in the Western Union service has more generally gone abroad, numerous inquiries have reached us, especially during the past few months, for information regarding the same. All such will be fully answered in the forthcoming article, which will be illustrated. The publication of the article has been deferred in order that it might embrace necessary descriptive explanations of the completed instrument in all of its full fruition of development.

Although it has occurred of late that commercial telegraphers have found employment to some extent in the railway service, it nevertheless appears, according to statements made by railroad officials in different parts of the country, that one of the effects of the enforcement of the federal nine-hour law is to make clear the fact that in frequent instances the railroads have been retaining a really unnecessary number of operators on their payrolls, as well as maintaining certain offices that might profitably be dispensed with. Thus it would seem up to the present time that the adoption of the new law, so far at least as it effects the condition of the railroad telegraph operator is concerned, is on the whole inimicable to, rather than promotive of, his welfare, inasmuch as its action shuts off not only opportunities for employment, but likewise curtails earning capacity on the part of the individual by reason of inelastic hours of service.

Thoughts for Reflection Affecting the Telegraph Service.

We frequently have had occasion to refer to the superior expert abilities combined with a general fund of all-around information possessed by telegraph operators of, say, twenty-five or thirty years and more ago, as compared with the inferior qualities of the same class and poor resulting service, so often met with to-day. The fact of the existence of such differences cannot, unfortunately, be gainsaid; it is becoming a subject of common remark, and the seriousness of the situation involved, because of its reality, is one that cannot be afforded to be overlooked in any summing up of the question and in arriving at an estimate determining the governing of present telegraphic conditions. The intelligent man observant of the situation, who is mindful of the evolution of change that is taking place in the calibre of the average individual at the key—a change portentious perhaps with possibilities sufficient to affect the destiny of the telegraph itself, has much to engage his attention and perplex his mind.

Of late years the field of the telegraph has narrowed materially. Competition, sharp, aggressive and constant, has been experienced because of the development of the telephone, its widening sphere of operation and the efficiency of service afforded. This rivalry in method of transmission has told heavily against the telegraph. Then, again, the fast mail, considered in connection with its spe-

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cial delivery features, closely linking points as widely separated as New York and Chicago, has had much to do with cutting into the volume of the telegraph business. Especially has this been true since the strike, when the turbulent operators were moving heaven and earth in their endeavor to heap obloquy upon the telegraph. The mail, while slower, of course, in its operation, yet in frequent over-night distances has nevertheless served admirably in conveying information that formerly was transmitted by wire.

Yet the desirability of the telegraph as a means of quick and accurate communication has not lost its potency, even though a certain measure of inefficiency and slowness of operation has mitigated against its usefulness to a degree permitting competing agencies to gain advantages over the older system that never should have occurred. It is not difficult to trace, in part at least, the trouble to its source. There is a manifest lack of conscientious work and effort and *esprit du corps* on the part of the personnel in the telegraph service that is responsible in direct and large ratio for the retrograde influences that have cut down the volume of business formerly handled by the telegraph ,and that in consequence have curtailed its earnings.

While there are natural causes antagonizing the telegraph that call for untiring ingenuity of astute management to contend against, the fact nevertheless remains that within its own bosom there is maintained and sheltered an element that is exerting an influence detrimental to its welfare. We have no disposition to be hypercritical in our strictures, for we have in mind the thousands of faithful workers in telegraph employ whose devotion to duty is not only above all criticism, but is entitled to words only of warm commendation and praise due to intelligence of mind, to honorable motive and loyalty of service, attributes of character that alone can influence and be productive of favorable results. As a rule, the longevity of service of all such proves and is a guarantee not only of their ability, but of their zealousness and integrity of purpose.

But of late years there has drifted into the service a class of operators whose presence at the key should be regarded as a distinct menace to the well-being of all interests, as it likewise constitutes an affront to the loyal and capable workers with whom they are brought in contact. Those referred to are mainly young in years, inexperienced in the profession, careless and indifferent in system, with no especial aim in life, yet because possessing certain mechanical qualifications in the manipulation of a typewriter, familiarity with which somehow seemingly secures to them the charge of circuits which some among the number should never be entrusted.

Outside competition which is to be expected and which is normal and fair, is one thing, but inside indifference and lack of fidelity, the exact antithesis of which should be the governing impulse of every honorable employe, yet when absent constitutes in the aggregate a force of embarrassment of much magnitude, is monstrous. Conditions in the telegraph service reflecting its past and present, with possibly a bearing on its future, furnish an object lesson which carries much food for meditative thought.

Government Ownership of the Telegraph.

The Central Labor Union of Washington, D. C., is calling upon all national and international labor organizations to write to Congressman Jesse Overstreet with a view to overcoming his objections to a hearing before his committee on the subject of government ownership of the telegraph. The circular that is being sent out is as follows:

"To the secretaries of international and national unions in the United States—Dear Sirs and Brothers: There have been several bills introduced in Congress this winter for the governmental ownership of the telegraphs of the country. These bills have been referred to the committee on post offices and post roads, of which Congressman Overstreet of Indiana is chairman. Mr. Overstreet, when requested by the two members of Congress who are members of the Commercial Telegraphers' Union, its international president, as well as the legislative committee of the Central Labor Union of Washington, D. C., to give them a hearing before the committee, so that they might present to the committee reasons why such a law should pass, refused their request. I was, therefore, directed by the Central Labor Union to communicate with the secretaries of the International and national organizations and make the request that they write to Mr. Overstreet and ask him to grant a hearing on these bills. A letter from you to him will be appreciated by those interested in this legislation."

The circular is signed by Sam De Nedrey, secretary-organizer of the Washington Central Labor Union.

William Bradfield, the president of the local telegraphers' union at Washington, was roundly denounced recently by the Central Labor Union of that city for asserting that the majority of telegraphers of this country did not favor governmental ownership. As a matter of fact, Mr. Bradfield was correct in his statement, and Congressman Overstreet in the position he has taken in refusing to bring a bill before the committee of which he is the chairman, having in view the taking over of the telegraphs by the government, is but exercising common horse sense in the matter.

The motive governing the action of the Central Labor Union is not actuated by any motive of patriotism but simply by a desire to "get even" with the telegraph companies.

F. S. Lewis, manager of the Western Union Telegraph Company at Niagara Falls, N. Y., in renewing his subscription for another year, says that "under no circumstances would I be willing to do without Telegraph Age."

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The Semi-Centennial of the Laying of the First Atlantic Cable.

This year marks the fiftieth anniversary of the opening of the first Atlantic cable over which messages were successfully sent. Tuesday, March 10, was the fifty-fourth anniversary of the signing of the original contracts for the organization of the first company having for its object the electrical harnessing of the old and new worlds to each other, for it was on the night of March 10, 1854, around the table in the dining-room of Cyrus W. Field, father of the cable, at his residence in Gramercy Park, that Peter Cooper, Moses Taylor, Marshall O. Roberts and Chandler White, with David Dudley Field present as counsel, signed the original contracts and joined their faith, money and reputation as sane men with the one idea, fortune, courage and indomitable will of Cyrus W. Field.

It was on that very day that Frederick N. Gisborne, of Montreal, the discouraged promoter of the Newfoundland Telegraph Company, whose object had been merely to connect St. John's, N. F., with the United States, says the New York World, surrendered his charter to the "mad-brained enthusiast" of Gramercy Park, who with his five friends seated around his English oak table, organized the New York, Newfoundland and London Telegraph Company.

The longest submarine cable in the world then lay between Dover and Calais, crossing the English Channel, not over thirty miles wide between those points.

On a part of the original estate of the layer of the first ocean wire lives to-day at Ardsley-on-the-Hudson, the sole survivor out of seven children of Cyrus West Field, Mrs. Isabella Field Judson, widow of William Francis Judson. The house is well stocked with mementoes of the originator of the cable. Here are the heavy oak dining table and the chairs, used by the original incorporators fifty-four years ago; the family portraits Mr. Field mortgaged on the outcome of his supposed hair-brained scheme, innumerable memorabilia, gifts, souvenirs, chests of books, pamphlets, original documents, pictures, letters, resolutions, speeches, menus, tributes, copies of laws and contracts, biographical sketches and recollections, some published and others in manuscript, of the wedding of the hemispheres written by Mrs. Judson and others.

Here, with the exception of one piece which is in the Field collection, Smithsonian Institution, at Washington, is the service of silver inscribed "From George W. Peabody to Cyrus W. Field."

Mrs. Judson is the treasurer of a wealth of oral information concerning the beginnings of the costly and discouraging attempts at hands across the sea.

In late years, notably in a book written by Mr. Bright, attempts have been put forth to show that the Atlantic cable had almost wholly its conception, birth and construction in the brains of Englishmen, an assertion which the loyal daughter protests with her perfect knowledge of the circumstances and events of a half century ago.

"My father often said," begins his child, "that it might have been thought of before he was born, but he was the originator of that work. For years before the final triumph, from the time I was eight years old until my first son was born, whenever we children wanted a new doll, a sunbonnet or a gown it was always 'Wait until the cable is laid.'

"As often as my uncle, David Dudley Field, came to our house his first toast at dinner always was, 'Brother Cyrus, let's have our toast first to the success of the Atlantic cable,' and as the years went on Uncle Dudley's toast was lengthened to this form: 'Brother Cyrus, let's have our first toast to the success of the Atlantic cable and then to the world encircling. You must put a cable around the globe.'"

It was Matthew Dickinson Field, elder brother and eminent engineer, who suggested while in New York, in January, 1854, to Cyrus W. Field, the project of a telegraph across Newfoundland as a long step toward Europe, the germ of latter day results. At the Astor House Matthew Field, returning from a residence in the South, had met the downcast F. N. Gisborne, who had failed for lack of capital to build a telegraph line across Newfoundland to St. John's, there to connect with steamers for Ireland, which would bring the news of Europe to America within a week. Matthew Field took Gisborne to the Gramercy Park house and introduced him to his brother, who had already made in the paper business all he had set out to lay by for himself and family—$250,000.

After Mr. Gisborne had gone on that night in January, 1854, the Atlantic cable, as Cyrus W. Field in his library turned over his globe, was born in his brain. For thirteen years thereafter, night or day, waking or dreaming, ashore or afloat, while eating, drinking or walking or talking, the Atlantic cable was his uppermost thought. He was so charged with the electricity of this new affection that his friends and some of his relatives called it an affliction. Upon the chimerical realization of his hopes he laid his fortune, his honor and his magnificent energy. In those thirteen years he crossed the Atlantic forty times and made half as many trips to Newfoundland.

It is the testimony of his daughter that when his friends saw Mr. Field coming their way they would cross to the other side of the street to escape from him. "If he gets a chance," they said, "he will talk us deaf, dumb and blind about his cable."

One of his friends, a deacon, wrote down from his home in Stockbridge, Mass., the original home of Cyrus W. Field, to Mrs. Field, to shut up her husband in an asylum, for he had evidently gone mad.

"I should call my father's work the triumph of genius over science," says Mrs. Judson, "for so it seems to be to me. My father never claimed

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that he was in any way a scientist and it simply was his patience, energy and perseverance that carried him on to the end."

Chandler White died in 1855. His place in the promotion of the cable enterprise was taken by Wilson G. Hunt, who stuck fast to the end. The promoter, Chandler White, and David Dudley Field went to Newfoundland in March, of 1854, and almost lost their lives in a blizzard off St. John's. The first to shake hands with them was Attorney-General Edward M. Archibald, afterward Sir Edward, for twenty-five years British Consul-General at New York.

The "neighbors" kept pouring their money into the swamps of Newfoundland until they had sunk hundreds of thousands, and the projector more than anybody else. The overland construction of four hundred miles took three years, and the first attempt, in 1855, to lay a cable under the Bay of St. Lawrence was a failure. In the next year another try was successful. It was one link in a chain.

Having reached the end of his material resources in America, the hardest part of the road lay before him—the luring of capital in England from its strong boxes to stretch the magical metallic fibers over the unseen bed of the big ocean.

For scientific assurance Mr. Field had a survey of 1853, showing a plateau between Ireland and Newfoundland, the opinion of Dr. Morse of ten years before, that the distance of 2,000 miles was not too great for the swift course of lightning, and the cautious opinion of Lieutenant Maury, of the Observatory at Washington, who conceded the possibility of the electric communication, but would not concede a time calm enough, a sea smooth enough and a wire long enough or a ship big enough to lay the coil.

Faraday was at first about the only man in England to give Cyrus W. Field a cheering word. When Mr. Field asked him how long it would take for the current to pass he said, "Possibly one second." The Yankee projector drew up the articles of the Atlantic Telegraph Company, and with Professor Morse called in 1856 on Lord Clarendon at the Foreign Office. Lord Clarendon, impressed more by the American's enthusiasm than by the feasibility of his plans, said: "But suppose you do not succeed; that you make the attempt and fail; your cable lost at the bottom of the ocean—then what will you do?"

"Charge it to profit and loss and go to work to lay another," was the answer.

Mr. Field visited James Wilson, Secretary of the Treasury, and as a result the British government guaranteed $70,000 a year for messages sent, and the father of the cable returned to a worse than lukewarm country and paid into the treasury of the company $440,000. In England Mr. Field enlisted in the cause William Thomson, then a mere electrician, who later became Sir William Thomson, now mourned, after his death recently, as the great Lord Kelvin.

After a lot of hustling and the passage of necessary laws, the United States named the steamships Niagara and Susquehanna, and Great Britain the Agamemnon and the Leopard to lay the cable. In August, 1857, just three hundred and sixty-five years from the day Columbus sailed from Spain to discover America, the ships steamed from Valentia Bay, Ireland.

The Niagara paid out first. The cable broke, and on the following Monday, the start having been made on Wednesday, at a point three hundred and fifty miles from the Irish coast, the frigate fell into the trough of the sea, rose on the swell and the strain again snapped the cable. With flags at half mast the flotilla returned to Valentia Bay and the coils were taken out of the holds, and the United States warships returned to America.

In the year 1858 four ships proceeded from Valentia to the middle of the Atlantic, where, stern to stern, the Agamemnon and the Niagara spliced cable ends from their tanks, and the ships started, two and two, in opposite directions. The Agamemnon pointed one way and the Niagara the other.

The cables parted almost before they were joined, not only once, but three times. The ships went back to Valentia and this time even the vice-president of the company refused to have anything more to do with it. When it was proposed to relay the cable he left the directors' room.

But they started again, and by a coincidence the Niagara landed her end of the cable at Trinity Bay, N. F., August 5, 1858, on the same day that the Agamemnon landed her end at Valentia Bay, Ireland.

The first message sent on that immortal day was: "England and America are united by telegraph. Glory to God in the highest, and on earth peace and good will toward men." Queen Victoria and President Buchanan exchanged congratulations and the country went wild with enthusiasm and Cyrus W. Field, who had been looked upon as a madman, was glorified.

In all seven hundred and thirty-two messages were sent over this cable. It was worked to death. Mr. Field on September 1, 1858, received this cablegram:

"Cyrus W. Field, New York:

"The directors are on their way to Valentia to make arrangements for opening the wire to the public. They convey through the cable to you and your fellow citizens their hearty congratulations and good wishes and cordial sympathy in your joyous celebration of the great international work."

The words "and good wishes and cordial sympathy" were accidentally omitted in Mrs. Judson's "Cyrus W. Field, His Life and Work."

It was the last distinct message that ever passed over the cable of 1858, the first cable, 1,950 statute miles long, without a single break, that spanned the Atlantic ocean.

But New York and the country celebrated just the same on that day. There was more than half a million jubilant people in the streets. Broadway was a garden of female beauty, for there

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was to be a parade. The cable layers, British naval officers, and the Jack Tars of the Niagara, bearing a model of their frigate, a big coil of cable, were all in line. There were ceremonies in the Crystal Palace, fireworks in City Hall Park, a torchlight procession of firemen, illuminations and a big dinner to Cyrus W. Field at the Metropolitan Hotel. While the celebration was in progress the City Hall caught fire and was badly damaged.

Speaking of the landing of the Newfoundland end of the cable of 1858, Mrs. Judson says that her father always insisted on making a sharp distinction between Trinity Bay and Heart's Content and the Bay of Bull's Arms, N. F., and it was at the last place that the cable of August 5, 1858, was brought ashore.

The Niagara, under command of Captain Hudson, left St. John's on August 12, 1858, with a small coil still in the tank, her Union Jack flying and a long streamer of blue, bearing in white letters twelve inches in length, "Atlantic Telegraph." Her father was anxious to give credit to everybody who had helped him, even to the sailors, who had christened him "Our Sister of Charity."

"Early on the morning of August 18," continues Mrs. Judson, "the Niagara anchored off the Battery, and my father immediately landed and drove up Broadway, delighted to see the decorations and amused to learn that he was the man of the day and hour.

"'This,' said my father, 'is in strange contrast with the years when my friends to avoid meeting me pointedly crossed the street when I came in sight.'

"He had been only a short time in the welcome seclusion of his home on the north side of Gramercy Park, No. 123 East Twenty-first street (the house still remains), from which he had been absent eight months, and a nephew had brought him numberless letters and telegraph messages, when his brothers told him the reporters were clamoring and would not be denied. 'They must see you and hear from your own lips the story of the Atlantic telegraph. Those are their orders,' his brothers told him.

"As the reporters entered the room Mr. Field told them they could have half an hour and no longer.

"One of the first questions asked of him was, 'When did you first think of undertaking the work, who have been with you in the enterprise and to whom should credit be given outside of yourself?'

"My father replied: 'Why, bless your soul, look at those boxes. They are full of papers and all give the history in some form of the last four years. Who first thought of the cable? Very likely one was talked about before I was born. This may interest you. On July 30 we found the Niagara had run several miles out of her course. She was paying out too much cable, and it was then discovered that our compasses did not work, and why? Because there was too much local attraction caused by the amount of cable that we had on board. We signaled to the Gorgon, and Capt. Dayman piloted us to the end. Four days and nights he remained at his post.

"'Everything that I have in the world—this house and even the portraits of my father and mother, are mortgaged, and the money has gone into this enterprise. I thought that was generally known,' my father told the reporters.

"Do you care to hear of our welcome at Trinity Bay? I landed near the telegraph station at two o'clock in the morning of August 5 and walked to the house, half a mile distant, through a wilderness, not a person being visible on the beach, and neither did we hear the sound of a voice until we reached our destination. The operators sent from London were asleep. They had no faith in our work, and they had not even unpacked their trunks.

"My father, David Dudley Field, and I were left alone, and it was then that his brother asked my father two questions, 'Have you ever felt discouraged and ready to give up?' and 'Do you know what your English friends think of your capacity for work?'

"'I cannot,' replied my father, 'as yet bring my mind to face or talk of what we may have been able to accomplish. At times it seems to me more than I can grasp, and I can simply say, 'What has God wrought?' To the second question he replied: 'My friends said that I never rested. They said: "We leave you at work in the evening and find you working the next morning." This was far easier for me than to keep still. The dread of leaving something undone, that I failed to think of what was required for the work, even the thought of that overpowered me.'

"On the evening of August 20 when Captain Hudson and Chief Engineer Everett were dining at our house my father told us how the cable of 1858 was not successfully laid until a second attempt had been made, for after the Agamemnon and the Niagara had on the first attempt kept their tryst in mid-Atlantic and a splice had been made the cable had broken three times, the last time when the ships were 200 miles apart. The ships returned to Ireland, and it was some time before he could persuade the directors to allow him to make another attempt. The Niagara sailed from Queenstown on July 17, 1858, and nobody gave her a cheer.

"...essful splicing was made half seas over at 10 A. M., on Thursday, July 29, 1858."

"After dinner that evening a crowd gathered outside the house to serenade my father, who, with his guests, stepped outside on the balcony. ... read this message, received on that day from Ireland:

"'Valentia Bay, August 19, 1858.

"'To Cyrus W. Field, Esq., New York:

"'The directors have just met . They heartily congratulate you on your success.

"SAWARD.'"

Mrs. Judson recalls how her father, with his brothers, family and friends, all climbed into a

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stage on the day of the celebration and rode to Trinity Church to give thanks.

The current over the cable of 1858 during its brief life had always flickered, but it had demonstrated the feasibility of the proposition. The high potentiality used caused induction and rendered the wire useless. Then came the mirror-speaking instrument—a tiny steel magnet with mirror, suspended by a human hair, whose flashes, dots on one side, dashes on the other, were read on a screen behind which was planted a lamp. Thus William Thomson, invented his recorder, and it was demonstrated that a drop of water, a tear, was sufficient to generate a current that would carry across the ocean.

One important message had been sent over the cable of 1858 that saved the English government a lot of money and trouble. That was the orders to the two British regiments in garrison in the provinces that danger from the rebellion in India was past and their orders to sail for home were countermanded.

Cyrus W. Field's fortune had all gone, his firm had failed, he had disposed of what shares in the Atlantic Telegraph Company he could dispose of and would have sold them all if he could have found a market. The public had become ashamed of its late enthusiasm. It had no more faith in an ocean submarine cable than multitudes to-day have in wireless telegraphy for long distances. The Civil War was on, arrangements were made to use Cape Race as a connecting point of communication with passing steamers, even as it is used to-day as a relay point for flashing the news of passing ships ashore, but fifty years ago the means of communication between vessel and cape was a small steamer bearing despatches in watertight cases, tossed overboard from a fleeting liner, instead of the mystic etheric waves.

Meanwhile the father of the cable was constantly crossing the Atlantic addressing boards of trade and public meetings everywhere, still harping on his cable. With the lights of new experience a cable was coiled on the Great Eastern, which was placed in command of Captain, later Sir James Anderson. She sailed in 1865, reeled off one hundred and fifty miles a day, and after 1,200 miles had been laid, the cable was broken. The Great Eastern went back to England and in the next year, 1866, the cable held and was laid at the very moment of the crisis of the war between Austria and Prussia.

England, from that day, July, 1866, when a landing was made at Heart's Content, Trinity Bay, has been clasped with hooks of steel to the United States.

Then followed the most daring attempt at submarine engineering, the fishing for the cable lost in 1865. They dragged the bottom two miles under the ship, and it took two hours for the grapple to reach the bottom. They got it up once, a slimy thing, but it broke away and went back to its bed of ooze, again casting for it thirty times they got it again and this time they held it and spliced it. These two cables of 1865 and 1866 worked perfectly for upward of twenty-seven years. The cables of 1858, 1865 1866 and 1869 have been long abandoned and the oldest one working to-day is that of 1873.

When the enterprise began to pay large dividends Mr. Field reaped some of the fruits of his courage and perseverance, but Mrs. Judson avers her father never made much money out of it.

From the beginning, when in May, 1854, the New York, Newfoundland and London Telegraph Company had a capital of $1,500,000 subscribed, to the present day, when at least one billion of dollars is invested in ocean cables, some strides have been made, and David Dudley Field's inevitable first toast "To the success of the Atlantic cable and then to the world encircling," has been realized.

Where Socialism Has Failed.

So many in this country are clamoring for the introduction of Socialism in one form and another, including federal and municipal ownership, that the experience the city of Brest, France, has passed through, is not without value as an object lesson. That city was considered an ideal one from every point of view as being well adapted for successfully carring out the essentials of that doctrine. It was a costly failure.

For three years that city of 70,000 inhabitants, has been under the control of the Socialists. They municipalized everything—from the serving of milk for the babies to the running of the theatres. All public affairs were conducted extravagantly. At the arsenal 10,000 men were employed to do the work of 1,000. While in 1904 only 5,000 persons received poor relief, in 1906 nearly 23,000 persons—one-third of the population—were supported by public charity. The municipal theatre expended $8,000 a year more than its receipts. Milk was sold in the poor parts of the town for 3 cents a litre that cost the municipality 7 cents. In three years the building trade fell off 90 per cent., and the local customs decreased 60 per cent. Three-fourths of a surplus of $90,000 in the city's treasury when the Socialists came into power, have disappeared and no one can tell what became of the money.

At the last election the Socialists gave up control of the city and the new administration will have a job to rescue it from bankruptcy. Considerable time must elapse before the town can expect to be more prosperous. But it will be longer before it forgets its experience with Socialism.

Mr. O. C. Greene, superintendent of telegraph, Northern Pacific Railway, St. Paul, Minn., in renewing his subscription for the current year, writes: "It is always with genuine satisfaction that I pay this bill. I can speak in the highest terms of your paper. I find it always both helpful and interesting. I trust that you may have many prosperous years to come in its publication It is doing a great service."

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Before the Telegraph Was Invented.

To compare the present with the ancient means of communication is to appreciate that you are living in the commercial twentieth century.

One of the first systems of aerial telegraphy was attempted in the fifteenth century. The origator was Amontons, at that time considered one of the cleverest scientists of the world. He developed a system of signal telegraphy so that a message could be sent from Paris to Rome in three hours. Those who assisted in the transmission of the message along the line were unable to tell the nature of the message. Posts were placed from Paris across the Alps at consecutive points, where men were stationed with telescopes. Different signals, representing combinations of letters, were run up at each post. The man at the other end, seeing the signal, placed a similar one before his post, and so the message was carried to its destination. The key to the signal was known only to those who sent the message in Paris and the recipients a thousand miles away. Amontons was not encouraged in his work by the puffy, gouty functionaries of the time and discontinued his efforts.

Perhaps the real inaugurators of the system of long-distance transmission of messages were the Gauls. If you leave your office some afternoon and see a friend across the street and cry, "Oh, there!" you are using a system of telegraphy in vogue in Europe until 1792. The cry of "huppa," from which the English "Oh, there!" was derived, was the mouth telegraphy of the ancient Franks, by which they sent a message at the rate of one hundred and fifty miles a day.

A number of men, stationed at certain intervals over a long stretch of country, sent messages, one to the other, so quickly that Caesar, in his Commentaries, said the natives forwarded warnings of his approach at the rate of fifty leagues from sunrise to sunset. At night they used signal fires or "hauchees." While tympans were beaten, fires were lighted from mountain top to mountain top.

To the tourist wandering through France and over the Pyrenees into Spain the old towers which appear from time to time across the mountain may seem purposeless and strange. Yet they are vestiges of the greatest system of old-time aerial telegraphy in existence. These towers—both square and round—are situated on the most prominent hillocks. Up to 1844—when experiments assured the success of the telegraph—these towers were the means of communication in France. In that year there were five hundred and thirty-five stations. The towers were two stories high, with index signals of light wood or iron mounted at the top of a pole on the roof.

This system was originated by Claude Chappe, and was presented to the National Assembly of France on March 22, 1792. Chappe had prepared a secret vocabulary of 9,999 words, represented by characters. The convention conducted a series of trials, and, elated by what its members called the simplicity of the scheme, adopted it. At that time France was at war with nearly the whole of Europe. The first telegraphic national message was received by Carnot, grandfather of a recent French president, telling of the restoration of Conde to the republic.

The news of the taking of Brussels by the French was transmitted from that city to Paris in twenty-five minutes. Messages were sent by placing signals at the top of the poles on the towers. The telegrapher at the one end mounted a ladder and changed them by hand. There was always some one on watch on the towers to note the signals from the others. The line of stations was extended by the first Bonaparte to Milan, Italy, and thence to Mayencé, Germany. As the French army retreated the telegraph posts were destroyed.

During the Crimean war (1854) a system of sending messages by the use of semaphores was adopted, by which messages were conveyed from one camp of the allied armies to another. Arms extended from a framework of wood, which could be operated by wires by a man below in a tent. By lifting or lowering the arms messages were sent from one division to another.

While the efficiency and success of the electric telegraph was assured by 1850, and wires were strung up all over Northern France, it was not until the end of that year that they were opened for public use. Even when private individuals were allowed to send messages they were required to give proof of their identity, but the secrecy of the despatches were considered inviolable. A few months after the wires were given for public use the first submarine cable was laid. —Express Gazette.

The Telegraph in Porto Rico.

The telegraph system of Porto Rico, since the occupation of that island by the American army, has made rapid strides, so that at the prestn time about fifty towns and cities have telegraph offices. Telephones, again, connect outlying districts with these, so that practically every part of the island can be communicated with. There are three private telephone systems in operation, in the north, south and east. By the terms of the old Spanish concessions for telephones in San Juan, Ponce and Majaquey, the system of these three towns will become the property of the insular government within less than ten years, and the other lines can be bought over by the government whenever it thinks fit.

In Argentina at the end of 1907 the national telegraph lines comprised 24,072 kilometers, with a total length of conductors of 57,551 kilometers. The total number of messages for the year was 10,420,012, equivalent to 1.6 per inhabitant, and 417 per kilometer of line. The revenue for the year was $2,255,375.

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Wireless Telegraph Plant at the United States Naval Academy.

The wireless station at the United States Naval Academy, Annapolis, Maryland, forms one of a chain of stations under government control extending on the Atlantic coast from Frenchmen's Bay, Me., to Galveston, Tex., says Lieut.-Commander W. H. G. Bullard, U. S. N., in the Electrical World. Other stations in this chain are located at Guantanamo, Cuba; San Juan, Porto Rico, Culebra and Colon.

The station was established in June, 1904, not as a transmitting station for long distance, but rather as a relay station to forward such messages as it would be able to pick up from other stations or from vessels bound up or down the coast.

For this reason the power installed was small, the station set having only a rated capacity of 2.4 kilowatts. This power is obtained from a storage battery furnished by the Electric Storage Battery Company of Philadelphia, and consists of forty cells, giving a normal voltage of eighty volts. When occasion demands, this battery is charged from power obtained from the main power station supplying the Naval Academy with light and heat.

The transmitting circuit contains the induction coil, condensers and spark gap of the well-known Slaby-Arco type. The direct current from the storage battery is led to the primary of the induction coil, and the make-and-break is effected by means of a mercury turbine interrupter, making 1,600 revolutions per minute. With a line voltage of eighty volts, a maximum of about twenty-five amperes may be used in the primary windings. The condenser consists of seven leyden jars, connected in multiple with a total capacity of .014 microfarad. The inductance is a spiral conductor of No. 8 copper wire, consisting of 9.9 turns of a mean diameter of seventeen inches. The spark gap is a single break between zinc electrodes with a normal length of ¾ centimeter and a maximum length of 2½ centimeters.

The receiving device now used is of the De Forest type of electrolytic cell used in connection with the head telephones of the Schmidt-Wilckes make. This cell uses a Wollaston wire, glass jacketed, and of .006 inch diameter, as the anode, and a platinum wire as the cathode, in a solution of pure nitric acid. In connection with this coil is used a primary battery, with potentiometer. Associated with the detector in the receiving circuit is a capacity .005 microfarad with a variable inductance of two coils of copper wire wound with 500 turns on each coil.

The aerial is a loop of a total length of 1,034 feet, consisting of four wires of phosphor bronze. It has a horizontal length of 100 feet and a vertical length of 166 feet. The aerial is coupled direct to the transmitter inductance and has a natural wave length of 335 meters. The wave length ordinarily used is 318 meters for the lower hump and 420 for the upper. With the coupled circuit for 425 meters, the lower hump is 348 meters and the upper hump is 500 meters.

Joseph Schnell, of Binghamton.

Joseph Schnell, now engaged in the drug business at Binghamton, N. Y., a former telegrapher, and a member of the United States Military Telegraph Corps, in recently renewing his subscription to Telegraph Age, writes pleasantly to say: "I don't see how I could get along without the paper now; it seems like renewing an old acquaintance. It has brought me in touch with many dear old friends of the telegraphic fraternity. In a former letter you refer to Mr. W. A. M. Grier, of Brooklyn, as having given the Schnell brothers, Thad, Andrew and myself, our first instructions in telegraphy at Milesburg, Pa., on the then newly built line called the Susquehanna River, North and West Branch Telegraph Company. That was right, he did. I have never seen him since, and often wondered what had become of him. I am glad to know he is still on earth, and is, I hope, prosperous. I remember him very well as a truly polished gentleman. When you see him again please give him my kindest regards. Show him the enclosed picture and ask him if he can recognize in it the youngest of the three brothers he instructed in the art of telegraphy away back in the 50's. I should love dearly to see him."

Joseph Schnell was born in Clearfield Borough, Pa., in 1842. He became a druggist's clerk in 1856 and while so employed learned the art of telegraphy. In 1861 he enlisted in the Bellefonte, Pa., Fencibles. At the end of three months' service he re-enlisted and was soon detailed in the service of the United States Military Telegraph Corps. In 1863 he was detailed to provost marshal duty at Williamsport, Pa., where he remained until mustered out in 1864. He then went to Binghamton, where he has been closely identified with the business interests of that city. Mr. Schnell made a creditable record as district supervisor of the United States census of 1890, his work being especially commended by the Washington authorities. He was reappointed for the same work in 1900. Mr. Schnell is a member of the G. A. R. and other organizations, and is esteemed as one of Binghamton's best and most loyal citizens.

New Western Union Office at Oklahoma City.

The new office of the Western Union Telegraph Company, at Oklahoma City, of which Harry Robinson is manager, occupied for the first time on March 8, is declared to be one of the best equipped telegraph offices west of the Mississippi River. The office employs about thirty operators. The operating tables having a capacity of one hundred, and seventy wires are cut in on the switchboard. Eleven motor generators displace 3,600 gravity batteries formerly used. Everything in the office is new. Besides the ordinary telegraph apparatus, the company has installed burglar and night watch machinery, and in a short time will start its sprinkler service.

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A Chapter of Reminiscence.

BY DR. L. M. RHEEM, OF MINNEAPOLIS.

(Continued from April 1.)

I have somewhere among my plunder of the long ago, the letter Superintendent Dickey wrote me when he received my monthly report. He patted me on the head, and on the back and all over, for the great increase in receipts, which in those days a manager did not have to explain.

It happened shortly afterwards that one of the brokers missed connection with his message, although it had been delivered correctly. Then another one missed, and then another. This made it necessary to extend and elaborate the scheme a little. The elaboration consisted of placing various articles in the office window so they could be seen from the street; each article stood for a certain active stock; as, Unabridged Dictionary, Hale and Norcross, Horseshoe, Ophir, Paper Collar, Con. Vir., and so on through a list of ten or twelve articles. The absence, presence of position of these different articles indicated either no change, or from one to four points up or down. The recipients of the messages had to memorize these articles which were arranged in the window as soon as the messages were received.

It was a liberal education in human nature to see three or four brokers, each one of which knew that he was the only man receiving a private message, go by the window in company and take an observation of that window without turning their heads, missing a step, or arousing the suspicions of his comrades.

While all this trouble was taken for the sole purpose of accumulating a few paltry dollars, the way the scheme worked was simply entrancing; George Muirson and I got so expert that we could play on that collection of junk until it sounded like a Beethoven symphony on a midsummer night, on a lagoon in Venice.

But real good things can't last forever; and in a few weeks the brokers discovered that when everybody in the game had a dead sure thing, the game became uninteresting and the pickings very light. Then came the cataclysm. I was waited upon by a committee of three brokers, two of whom were private message men, and asked to tell upon my honor whether I was delivering the stock list to any members of the exchange. As this question was equivalent to several things, I became genuinely indignant, and told the committee that I was not delivering the stock list to any members of the exchange, and furthermore that I did not propose to rest quietly under implied charges to that effect; that I was a first cousin of Caeser's wife, and that our entire family, consanguineous and collateral, had always gone short on suspicion; at which declaration the two private message men breathed much easier.

The next question was: "Had any of the members of the exchange been receiving private messages? To this I replied that "the rules of the company especially prohibited the giving out of any information whatsoever, concerning the business of its patrons." I was requested to accompany the committee to the exchange, which I did. Upon our arrival at the exchange, we found that during the absence of the committee, the remaining members of the exchange had been holding a sort of love feast; everybody had confessed up, and all of them were busy in the formulation of a "gentleman's agreement," stipulating that "Never again, etc., etc."

When I left the exchange, I did not feel nearly so optimistic concerning the future of the Denver office as I had the day before. The future looked dark; but that afternoon I received a letter from Mr. Dickey granting my request for a leave of absence to visit the Centennial Exposition, and asking me whether I would accept the position of manager of the Omaha office on my return, relieving Mortimer A. McCoy, who was in bad health. Would I? You know it; I was so afraid he might change his mind that I wired him that I would. That afternoon one of the deepest dungeons of the Chateu d'If would have looked good to me. I wanted to get away where I could think.

In a few days I was relieved by Mr. Edward Lackner, who had to explain the falling off in receipts in the report for that month; I do not know what his explanation was, as I was so busy packing up to get away. When I got back to Omaha from the East, the first thing Mr. Dickey said to me was that the receipts at the Denver office had dropped off frightfully just as soon as I left there. I was so afraid that he would send me back that I told him the whole story, which, of course, squared things for Lackner.

Those brokers in Denver were good fellows, and when I left town, a number of them went to the station to see me off, and the journey east was made much pleasanter by the cigars and blandishments with which they packed my grip.

Mr. B. F. Woodward, Mr. Huyck and Mr. Armstrong, managers of the Western Union Telegraph Company, and other old time telegraphers in Denver at the time, I also remember for their courtesies.

Denver at this time was the Mecca for persons suffering with pulmonary tuberculosis; among those who came there seeking a cure for the malady was George Armstrong, an old time telegrapher from Cincinnati, who passed away a year or two after the time of which I write. During my stay in Denver George and I became fast friends; we shared a room at the Wentworth House in the upper end of the town. A great many consumptives made their headquarters at this hotel, which George used to call the "coughin' shop." Armstrong was one of the few men I have met who had overcome the fear of death; he knew that he had to die in a short time and was prepared to meet his fate without a quaver. His quaint and humorous way of expressing himself on this subject is something I will never forget.

It is a comparatively easy matter to meet death

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when the bands are playing, the flags flying and the crowd cheering; a man has an idea that perhaps in the distant future, a memorial may be raised to commemorate his heroism, and that he may be held up to future generations as the typification of courage. It is a far different matter to sit down to a tete-a-tete and a game with death, prepared to play the game to a finish; there are no bands playing, flags flying, nor any great amount of cheering; you simply look right into his eyes and wait month after month, or perhaps year after year, and you feel that the prospect of a memorial to your courage is very remote.

But what is this thing we call death anyway? In its last analysis is it anything more than passing from one room to another? No. That being the case, why is it that we cannot leave the room like a gentleman, with a pleasant "Good-bye, I'll see you later," to those we leave behind us? That's the way I want to go out when my time comes, but whether I will or not is another matter. Modern methods present so many different means of communication between the two rooms, that it has always been difficult for me to pick my route. I carry what we call life and accident insurance; some of my life insurance policies say I have got to die within a certain prescribed area or I get nothing; I did not "read the policy" when I got it as the print was too fine, or I never would have taken it. After I had it a few years I discovered that I could only die between the Tropic of Cancer and the Arctic Circle; when I read that clause I felt myself shrink quite a little, as the authorized space seemed pretty small.

My accident policy is much better; that gives me permission to go into the other room by any way, shape, manner or form and in any part of the known world, provided I slip in accidentally, i. e., when nobody is looking; and if I ride in on a street car, railroad train, passenger elevator or steamship, whether the same is operated or propelled by steam, electicity or any other power, or on any kind of a public conveyance, I get two for one. That certainly has a pleasing appearance to me; reminds me of the double O in a game they used to play in Denver and Cheyenne, in which "twenty could play as well as one."

This, however, is a digression which you must overlook.

Previous to my going to Denver it had never rained there; at least that is what they told me. But my coming seemed to sort of loosen things; for a short time after my arrival it started in to rain as if it were never going to do anything else. We got word from Boulder that "Cherry Creek was coming down." When this news got on the street, everybody quit work and started for Cherry Creek, which was a little rivulet between high sand banks, and hardly deserved the name of a creek.

I did not know what was going to happen, but went with the rest of the population; shortly some one cried "Here she comes!" The "she" was a wall of water about fifteen feet high filling the banks full and coming at a pace that made it a really terrifying spectacle. There were two foot-bridges and a rather expensive wagon bridge across the creek; the flood tossed the two foot-bridges out of the way, and to save the wagon bridge from destruction by some large warehouses that were on the caving banks just above the bridge, the mayor ordered the warehouses set on fire and destroyed; as night had fallen the picture presented by the rushing waters and the lurid flames was one well worth seeing. The next morning little Cherry was back in the middle of its bed again needing water as badly as anyone after a night out.

Speaking of this rain and flood reminds me of a phenomenon that I ran across out there that is peculiar; it was that they could not get a perfect "ground." Now for some reason or other this has always jarred upon my finer sensibilities; it appears so incongruous, that in a country where you can get a perfect anything, from pancakes to potatoes, you cannot get a perfect ground. It makes a man feel that he has nothing to stand on. At Cheyenne, I have been told, in order to get a ground they have to go way out in the country to a creek where they have an enormous plate of copper buried in the creek bottom. I have never seen the creek or the copper plate, but I believe them to be there just as much as I believe any other story about that country.

On account of this geological freak, we were never able to tell when the lines were down; if the weather was dry the wire would work just as well on the ground as on the poles; if it was wet you raised the adjustment a little and kept on working. Once in a while you might reach the range of the adjusting spring and then the lineman had to get busy and pick things up.

I think it was during the rain previously mentioned that this happened; I was working with Cheyenne on an adjustment so high that it made me dizzy every time I would look at the floor, when the operator told me that the line was down and that John G. Morse, the lineman, would be down from Cheyenne in a day or so and fix it up. John came down and cleared the line; when I asked him what he had found, he said the wire had been down in Boulder Creek and broken. Now this is hard to believe, but there we had been working over a broken wire and using about thirty feet of pure water as a patch; if that isn't the prize reminiscence I don't know what it is.

As I say, this thing worried me and I wanted to find out the reason for it; I pestered every one I thought ought to know anything about it and accumulated as fancy a collection of reasons as any one could wish for, but they were unsatisfying. I asked C. H. Summers about it once and he said he would explain it to me; he took a piece of clip paper and filled it full of logarithms, square roots, cube roots, algebraical equations and geological dewdads, explained his hieroglyphics, and asked me if I understood it now. I told him "Yes." But to be honest I didn't.

I felt just like a two-year-old kid chasing a runaway milk wagon for a drink of milk; I could

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not catch on; but for fear Summers might hear of it, I quit pestering people about it. I thought about Summers' explanation for nearly twenty years before I caught on to the "string" in it. In the meantime I had figured out the reason for myself.

The cause of the phenomenon is a solution of continuity between the Dikellocephalus and the Laurentian, primarily established by a latitudinal displacement of the vacuuminal center created by the reaction between the unessentiality of the constant atmospherical components and the gases produced by the excess of calorics liberated, resulting in a raising or warping of the edges of the superior formation.

I have found some persons who have disputed this, but none of them have ever lived in either Denver or Cheyenne.

The Denver of '76 has long since passed away, and the empire builders who made it possible have nearly all gone to join the great majority; their descendants, however, have replaced the old town with a beautiful city that cannot be surpassed for beauty of location and pleasant environments by any city of these great United States. The men who have the guiding of its destinies are filled with the faith of their forefathers, and have the ability needed for the development of the Empire of the West, than which there is no greater in the world.

I often wish I had stayed there when I was there; and in looking over this imperfect and poorly written chronicle, it occurs to me that my readers will wish that I had. In a new country many things happen unexpectedly, and in their happening certain individuals are permanently eliminated; I might have been "one of the ones." A clairvoyant told me one time that I had escaped serious throat trouble by moving; she did not say whether the throat trouble was the kind they used to have out there in connection with a lariat and a telegraph pole, or not; but any way, I moved and we will have to let it go at that.

Report of the American Telephone and Telegraph Company.

The annual report of the American Telephone and Telegraph Company for 1907 shows total profits of $23,479,290 and a balance available for dividends of $16,269,388, or the equivalent of 10.67 per cent. on the company's outstanding $152,528,000 of capital stock, as against 9.86 per cent. earned in 1906 on $131,551,000 of stock. The year's profits exceeded those of 1906 by $5,621,603 and the gain in surplus was $2,550,041. The aggregate surplus as of December 31, 1907, was $30,738,418.

The extent to which the telephone system was developed during the year is clearly brought out by the following statistical comparative figures

	1907.	1906.	1905.
Exchanges	5,108	4,889	4,532
*Aerial wire	3,057,138	2,574,571	2,183,167
*Underground wires	3,883,051	3,241,571	2,585,742
*Marine wire	6,322	11,600	9,373
*Total wire	6,946,511	6,007,732	4,778,282
No. circuits	1,541,727	1,384,175	1,135,449
No. employees	88,274	90,324	74,718
No. stations	3,035,533	2,727,289	2,241,367
No. daily cons	18,130,803	16,478,058	13,543,468

* Miles.

President Vail in his remarks says that the number of stations connected to the system during the year was 3,839,000, or an increase of 768,340 stations. Although the increase in the number of subscriber stations directly operated was considerably less than in 1906, by reason of a more rigid collection of bills and a more careful scrutiny of applicants, there was a decided improvement in this class of subscribers.

Of the $2,921,400 expended for construction, $44,184,800 was for exchanges, $4,426,400 for toll lines and $4,310,200 for land and buildings. During the year $36,626,667 was applied out of revenue to maintenance and reconstruction purposes. Careful estimates made of the construction requirements for the coming year indicate that the maximum expenditure will be well within the company's available resources.

The gross earnings of the operating companies —not including the long-distance business of the Bell Telephone Company of Canada—are given as $120,753,200, an increase over the preceding year of $15,311,600. The balance earned by these companies available for dividends was $25,819,700 and the undivided profits amounted to $6,613,600, or a gain of $897,400 over those for 1906. The company's present outstanding 1,525,280 shares are distributed among 23,469 shareholders —an increase of 5,275 over January 1, 1907, and an average of sixty-five shares to each stockholder. More than three-quarters of the entire share capital is now held in New England.

The obligations of the American Telephone and its associate companies are stated at $554,939,000, against which there stands working assets and sundry investments valued at $101,074,000 and plant investments representing $453,865,000 and having an appraised value of $488,296,000. President Vail discussed at length and corrects many misapprehensions regarding the telephone business and the resultant repeated legislative attempts made to regulate rates; he talks about various other phases of the company's policy and notes the fact that the year 1907 practically completed the thirtieth year of corporate organized work in the telephone field.

Mr. Richard O'Brien, assistant superintendent of the Western Union Telegraph Company, Scranton, Pa., remarks in a recent letter: "I take great pleasure in forwarding check covering my subscription to March, 1909. They tell me Wall Street is full of great bargains just now, but for a good investment give me Telegraph Age every time."

Sample copies of TELEGRAPH AGE will be sent free to all intending subscribers.

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The Yetman Typewriter-Transmitter.

The Yetman Typewriter-Transmitter Company, manufacturers of the telegraph transmitting device bearing the name of Yetman, formerly located at Ilion, N. Y., has lately removed its plant from that point to North Adams, Mass. In this thriving New England town, with all the advantages accruing from fine location, to ownership of property and to a complete equipment of machinery specially designed for the purposes intended, the future manufacture of this well-now-known instrument, which originally reached a large sale, may be considered as successfully reinaugurated.

The factory at North Adams is a large brick building with 40,000 feet of floor space. It was constructed for the manufacture of tools, and is well adopted to the business. It has an up-to-date power plant, and the heating, lighting and plumbing are in excellent condition. Connected with the building is a vacant lot of sufficient size to construct a building twice the size of the one occupied. The original cost of this property was over seventy-five thousand dollars, and it could not be reproduced to-day for that amount.

The company owns a complete factory equipment for the manufacture of the typewriter-transmitter. It consists of machinery, jigs, punches and dies, and special tools complete to manufacture the entire machine after the most modern and economical methods, and could not be reproduced for $350,000. The special tools were designed and made by the most expert and experienced typewriter mechanics known to the art, and this most essential part of the factory equipment alone cost $120,000. The machines which have been produced from these tools have been uniformly successful, showing that the equipment while practically new is perfect in practical operation.

The manufacturing end of the business is in charge of Mr. Charles E. Yetman, vice-president and general manager of the company, who has had charge of the manufacture of the machine from the beginning. He will devote his entire time to the factory. He has under him in each department the ablest men in the typewriter field—men who have been engaged in this line all their lives and were connected with the manufacture of the first fifteen hundred machines, and the construction of the tools and appliances with which they were made.

The first floor of the factory is devoted to the making and assembling of the lower part or base of the typewriter, including key levers, finger keys, etc. The second floor is given up to the making of special tools, screws, rivets and other small parts used in making typewriters. This department is fully equipped with automatic screw machines and other machinery of the latest models. The assembling room is on the third floor. Here the complete typewriter machine is put together. The transmitting part of the machine is assembled on this floor. The fourth floor is called the "finishing department." Here typewriters are aligned, assembled with the transmitting mechanism and finished as complete typewriter-transmitters. The method of final inspection is very thorough and is attended to in this department. In addition to the main divisions the nickel-plating, polishing, and japanning departments are fully equipped and each in charge of competent men.

The company's organization for exploiting the Yetman typewriter-transmitter is well under way. General salesmen have been sent out in different parts of the country and it is expected that before long local agents will represent the company at all important telegraph points. New machines are being shipped to operators who are using the Yetman typewriter-transmitter with entire satisfaction. The company's facilities for manufacturing make it possible to fill at once all orders for machines and extra parts. The main offices of the company are located at North Adams, Mass.

The Yetman typewriter-transmitter, the invention of Mr. Charles E. Yetman, who served some years as a practical railroad telegrapher, consists of two machines in one case—a perfect visible writing machine, built for speed and durability, and a transmitter of Morse signals that takes the place of the telegraph key. It can be instantly connected with any telegraph circuit without requiring any change of equipment.

The transmitter and the typewriter are operated by the same keyboard, and may be used separately, or both may be used together to produce a simultaneous mechanically correct copy of the matter being transmitted. This is a most valuable feature, and one that strongly appeals to train despatchers, who are required to do an unusual amount of sending from memory, and who must depend upon an assistant to make a record of each message or order sent. The speed of the transmitter-sent signals may be instantly controlled by turning a governor button, conveniently located, to adapt them to the varying wire conditions, and the ability of the receiving operators.

The typewriter part of the machine has been subjected to the severest possible tests, covering a period of many years of practical work. Every letter, every word, and every line written, is in plain sight from the time the first letter is struck, until the paper has been removed from the machine. That this feature of "visible" writing is invaluable in a typewriter to be used for telegraph purposes is admitted by all.

The carriage is returned by one direct downward movement of a lever at the right of the keyboard; the line spacing is accomplished automatically at the same time by the same motion. The paper feed has been constructed with special reference to the rapid handling of telegraph blanks. The carriage moves upon ball-bearings, and the typebars, which are the real life of a typewriter, are connected into their hangers by ball-bearings. The touch is exceedingly light, and is absolutely uniform in every part of the

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keyboard. The transmitting typewriter excels in speed, ease and uniformity of touch, permanence of alignment, manifolding and durability.

The transmitter part of the transmitting typewriter makes it possible for a telegraph operator to transmit Morse signals which are absolutely perfect by touching the keys on the keyboard. The touch used is the ordinary quick staccato typewriter touch. Each Morse signal, and the elements of which it is made up, namely, dash, dot and space, are transmitted by the mechanism of the transmitter with absolute accuracy and uniformity, independently of the skill of the operator. The space between the signals, however, is entirely within his control, so that he can space the letters in difficult words more widely than in others, and use that fine judgment possessed by all intelligent operators which is absolutely inseparable from efficient telegraph work, and which no mechanism will probably ever be able to supply.

The rate of speed at which each signal is transmitted is also governed by the mechanism of the transmitter and is always uniform. All rates of speed from very slow to very fast are secured by turning a button at the right of the transmitter. The proportion between the length of the dot, dash and space, however, always remains the same, and is so arranged as to make the signal firm, or as firm as it is possible for a signal to be made at the rate of speed used. This firmness and the absolute uniformity of the transmitter-made signals, insures their carrying through the longest circuits and through the largest number of sets of repeaters, at a much higher rate of speed than is possible by hand.

The transmitting typewriter was designed to do, and is now doing, for telegraphers what the typewriter did for penmen and the linotype for typesetters. It provides telegraph operators with a device for transmitting Morse signals over a telegraph wire by use of a keyboard, enabling them with one unskilled touch on any key to produce the equivalent of that letter in perfect Morse upon the wire.

It reduces the effort to send fully fifty per cent. even to the most perfect and easiest of hand senders. It places the operator on a permanent sending basis and enables him to cope with the heaviest kind of work with the least effort, accomplish with more skill and greater ease as much work as an expert hand sender. It positively prevents any operator from losing his "grip" or from having any trouble with his arm. It enables the man who has already lost his "grip" to become an expert sender again. The old timer may be brought to life with all his former vigor and made capable of doing at an advanced age as much work and better work than in his youth. The Yetman transmitter is the reverse of the hand-sending key, inasmuch as one's skill increases as long as the machine is used while the effort diminishes. It will do for operators on the sending side as much as has already been done by the typewriter for the receiver.

The Yetman transmitter lightens the work of the receiver for the reason that all combinations are eliminated. At the end of a day's work you will feel much less fatigued than if sending by hand because you have been using both arms, both hands and all the fingers of each hand to do the work of two or three fingers in a cramped position. This equalizes the effort to both arms, both hands and all the fingers. To use the Yetman transmitter properly is merely the acquirement of correct finger habits and this serves a double purpose in scientifically training the operator to become both a rapid sender and receiver.

The Nerve Strain of the Telegraph Operator.

Few people know the real facts touching the life of a telegraph operator or the effect of their work on their health. The character of this work not only acts unfavorably, but probably it is the most deleterious in its effects upon the operator to that of any other trade or profession. Why? Because of the uninterrupted continuance of nerve tension, monotony of sound, close fixity of attention, the work being the reception and brain arrangement of monotonous "clicking," demanding very close and arduous attention.

That this condition of concentrated attention is most acutely enervating is the unanimous testimony of physiologists. During severe pressure of work upon the operator there is an interference with normal breathing, increased action of the heart, and rush of blood to the head. You know how we breathe when we wake up in the night and think we hear somebody moving about the house; and are trying to locate them by the sound. You know how we breathe (especially women) when a messenger delivers a telegram, and want to know who it is from, but afraid to open it.

Well, that is exactly the way telegraph operators breathe when over-crowded with business and when the sending operator is speeding with great rapidity. In the course of years all this tells on the constitution and shortens life. Telegraphers who follow their occupation for years die younger than other people. The statistics of the Royal Commission in England states that out of every one hundred operators who die there before they are fifty-five years old, sixty die from heart disease, consumption or paralysis. It is true, however, that some operators die, not from their exacting work, but from dissipation. In this respect operators themselves owe a duty to themselves—to get plenty of fresh air, exercise, plenty of sleep, and to abstain from all intoxicants in order to care for the nervous system in the best possible manner.

The city of Philadelphia, having hatched up a bill of $16,000 against one of the telegraph companies, has kindly granted the offender thirty days in which to pay this tidy sum, under penalty of having its poles chopped down.

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Telegraphers' Cramp.

The Telegraph Chronicle, of London, prints what it terms a "memorandum" relative to telegraphers' cramp, a subject discussed by J. M. Robertson, M. P., an old telegrapher, and addressed by him to the post office (telegraph) authorities. It was said that unless measures were adopted to ameliorate this trouble in the English telegraph service the disease should be scheduled as "one due to occupation."

In this connection it may be observed that from statistics obtainable it is apparent that telegraphers' or writers' cramp, is more prevalent in England than in the United States, notwithstanding the fact that the operators in this country outnumber those in Great Britain at least five to one. In America telegraphers are quick to adopt devices designed to overcome this malady. Hence transmitting machines are freely employed by operators threatened with this form of paralysis, engendered by the constant use of the key. Dot-making machines have no doubt saved the arms of many good telegraphers from permanent disability. The tendency so frequently noted in the case of the English operator to succumb to this dread form of cramp may be attributed, we believe, in large measure to the up and down motion of the hand and arm in manipulating the telegraph key. A remedy for the evil complained of might be found by the adoption of improved sending apparatus. When it is remembered that excellent results in overcoming this trouble have been achieved in this country by the use of automatic sending devices, it would appear that like attainment would follow their more general use in England.

What Mr. Robertson had to say follows in part:

"The alarming increase in the number of cases of 'telegraphers' cramp' demands that some searching inquiry should be made into the causes, and that earnest consideration be given to the possibilities of prevention, and alleviation of the conditions which are producing such disastrous results. The physical and mental strain consequent upon the arduous and exacting duties of an expert operator, has been freely admitted, yet so far no attempt has been made to deal with the question.

"Charles E. Yetman, the inventor of the most recent typo-telegraphic apparatus, in his treatment of the subject of cramp, has made the following statement: 'An expert operator must move one set of muscles in his right hand 800 times in sending forty words per minute, 48,000 times per hour, and 318,000 times per day. It is not difficult, then, to believe that an occupation which demands this unnatural and continued stress, on a comparatively small portion of the human system, should in a number of years of constant application tend to produce both nervous and physical deterioration of the worker. Indeed, it is not unusual to find that a few years have been sufficient to play havoc with the arm and nervous system of a young operator. The magnitude of the postal telegraph service, and the local conditions obtaining thereto, illustrate in the most marked degree both the cause and effect."

* * *

"Operators who are laboring under cramp at the present time should not be threatened with punishment because of their misfortune, but should be placed in branches where specialization is essential, such as counter delivery and circulation duties, and in which sections work of a valuable character is performed.

"In conclusion, it is submitted that although the post office possesses almost a monopoly of telegraphy in Great Britain, and although telegraph cramp is regarded as a distressing malady, resulting often in total incapacitation of an operator, nothing has been done officially to inquire into its causation. The post office medical department should be asked to report on the question, and serious steps should be taken to discover not merely how most usefully to employ afflicted operators, but what preventative steps can be taken.

It is quite possible that experienced medical men having a knowledge of the conditions under which operators work, and almost daily seeing them engaged in their duties (if there are any such) would be able to help the staff and the department in dealing with this form of disease."

Oriental Secret Telegraphy.

The hope that the movements of troops against the Zakka-Khels will prove "a regular surprise" to these erring tribesmen leaves out of account the mystic Oriental power of rapidly and secretly communicating news over vast distances.

An instance of this strange faculty was furnished during the Indian frontier expedition against the Waziris in 1895. Seventy-five miles as the crow flies and 120 miles by mountain roads from their base at Sheik Budin the British troops defeated the Waziris. Heavy mist prevented the news of this success being heliographed until the following day, when, communication being opened up, the British officer at Sheik Budin anticipated the news of the victory by stating he had been informed of it by natives on the very evening of its occurrence.

The most famous instance of this sort is associated with the assassination of Lord Mayo by a convict in the Andaman Islands. Within a few hours of his murder an English official at Simla was told by his Pathan servant that the viceroy was dead. Telegrams announcing the news did not arrive until the next day.

How such messages are transmitted is hidden from Europeans, but again and again in India, as also in Egypt during the Sudanese campaigns and in South Africa during the Boer War, the authenticity and speed in such native telegraphy were proved.

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The Military Telegraph in the Civil War.

PART ONE.

As the period of the Civil War lapses more and more into the indefinite past of long ago, there is danger of burying in oblivion much that transpired during that stormy time that it is well to preserve. The animosities awakened by causes long since and forever settled, yet which developed into dreadful actualities of war, are all gone, stripped of their harshness and softened by time, leaving events as they occurred only as historical data over which the student of to-day ponders and wonders. The part that the faithful little band of military telegraphers (small by comparison with the great armies engaged), acted in that mighty drama of life, possess an interest within the telegraphic environment that as time passes and the number remaining who were engeged in such service grows appreciably smaller and smaller as each year passes, appeals with a pathos of feeling and patriotic pride over which we in these later days delight to linger in loving recall.

Colonel William R. Plum, of Lombard, Ill., the historian of the military telegraphers, whose book, "The Military Telegraph During the Civil War in the United States," preserves in careful and abundant chronicle the history of that body of telegraphers, to whose loyalty, devotion and intelligence, displayed in behalf of their country during the critical years of war, entitles them to be held in memory's hightest esteem—Colonel Plum, we say, has collected during a life largely devoted to the cause of the military telegrapher an immense amount of reminiscent matter of war experiences contributed in letter form by those who were actors in the scenes which they describe. It was originally intended to embrace all this in the book referred to, but its great volume precluded such employment of the matter, and it has never been published. Instinct with the interest always attaching to the dramatic touch of personal encounter, this correspondence furnishes an interesting viewpoint concerning historic events in which many of the telegraphers were humble yet important actors. It will be observed that they shared the dangers of war equally with the regularly enlisted soldiers.

This great mass of correspondence furnished by writers, some of whom are living and many dead, has been turned over by Colonel Plum to Telegraph Age for publication in such form and sequence as it sees fit. Without any attempt to edit the letters and present the resultant whole in any form of story, it has been determined to print individual letters, believing that such a course will best preserve the charm of personality as expressed in originality of utterance. It is probable that the publication of these letters will be continued through many future issues of this journal, and we feel sure that they will be received with very general interest and approvak

The first letter selected for publication is one from the late Jesse H. Bunnell, who organized and was for many years the head of the now incorporated company bearing his name. It was written in New York, and bears the date of July 21, 1879. Without preliminary, Mr. Bunnell plunges at once into his subject, as follows:

"I arrived at Annapolis May 9, 1861. It was my first appearance at the front. I was at home in Massillon, Ohio, on a vacation from the Pittsburg office, where I had been working a 'through' Cincinnati and Louisville press circuit for a year previous, when I learned of the need for operators for the United States military telegraph. I went on at once to Philadelphia and from there was immediately sent to General Benjamin F. Butler at Annapolis. At that point I remained about a month when I was again sent to follow General Butler at Fort Monroe. At that time I was seventeen years old. On my arrival at Annapolis I immediately wrote to my chums, A. Harper Caldwell and C. W. Jacques, who soon joined me. I remained at Fort Monroe and at Hampton until about August 1, when I went to Washington. During the shipment of McClellan's army to Fort Monroe I had an office on board the steamer Commodore at the wharf at Alexandria, Va., where we kept up communication with headquarters as to the progress of the work of shipping the army on the transports. Then with A. Harper Caldwell and C. W. Jacques and myself as McClellan's headquarters operators, we went to take part in the Peninsula campaign. At Yorktown I was on duty alone after two A. M., on the morning of the evacuation, and received from various posts the startling messages in rapid succession, which woke first, the general staff and then the whole vast army to a morning rush after the enemy and into the fight at Williamsburgh. After the usual run of incidents of those times, such as camping, moving, building lines, etc., my next interesting adventure was at the second of the seven days' fight—the battle of Gaines Mill. Possibly you (Colonel Plum) can find the messages I sent and received that afternoon. I had been detailed at General Porter's headquarters for a few days before his falling back, and on the morning of that movement, having no horse, I had missed the line of march and lost my way. About twelve or one o'clock, however, I struck the road on which a telegraph line was strung. At this point I also found that a line of battle was being formed for a stand about one hundred yards to my rear. I therefore cut the wire, inserted the instrument, sat down behind a tree and called McClellan's headquarters. Harper said they regarded my opening communication at that moment as a godsend. I had no orderlies. General McClellan sent me a message to stop the first mounted officer or man passing along that road and order him in his (McClellan's) name to take a message to General Porter to send me fifteen orderlies and communicate with him by telegraph. This I did, and for several hours I sat very close to that tree and sent and received many messages as to the progress of the battle of which I was getting a very fair sample from the continuous roar of musketry, cannon, cheers, yells and any number of overshot shells, solid shot and bullets, until suddenly we all 'came away' together in a 'rush.' The whole line was driven back at that point pell mell. I reached headquarters at 11 o'clock

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that night. This was, I think, January 21, 1862. I was taken sick at Hamson's landing, and returned home to recuperate for a few weeks, afterwards joining General McClellan in the Maryland campaign.

"I left the army of the Potomac headquarters at Fredericksburg to join General Rosecrans' headquarters at Stone River and was accompanied by John Holdredge and Manager "Bob" Talbot. At Chattanooga I took charge of headquarters office in the field. Colonel John C. Van Duzer was the superintendent of the military telegraph. At the battle of Chickamauga I had a wire at Widow Glen's house (this house is still standing, preserved by the government in a national reservation). McBaldwin was with me. General Rosecrans made this house his headquarters during the first afternoon's battle at Chickamauga. Upon the retreat into Chattanooga Colonel Van Duzer, at the head of all the telegraph builders and operators, worked all that night running a trip wire about ten inches from the ground in front of the entire line of works, placing the line of wire a few feet in front of the abbatis.

"Following these events there came a period of starvation in Chattanooga, with plenty of hard work, etc. Then came Sherman's march to Atlanta, with the usual run of adventures and labors, until when, on August 16, 1864, my health being again in a precarious condition, I came north and returned not again."

Making Secret Cable Codes.

In view of the recent theft from the American legation at Bucharest of a copy of the state department's cipher, used in private correspondence between Washington and the American diplomats abroad, one of the few expert code makers in this city, says the New York Evening Post, was asked whether it would be possible for a person to interpret the government's code, if he were unfamiliar with it. The code maker thought the cipher might easily be read, if it were a cryptograph, as he believed it to be, and the silence of Washington with regard to the stolen copy gave point to his remarks and seemed to indicate the significance of the "leak."

Code makers are frequently called upon to decipher messages which have puzzled their recipients, and they usually succeed in making a sensible interpretation; indeed, they are able to read any cipher unless it has been altered by preconcerted signals. This is one reason why business houses require absolute secrecy on the part of the experts they employ to make their codes, and why the books are so carefully guarded thereafter.

Since the early days of cabling, business men have found it convenient and economical to convey information by means of single words or phrases. Such a word as "Jones" might mean "The price of wheat has gone up," and contain other facts regarding the grain market. But these codes were crude as compared with those to be developed later, and now a man may have a little book, weighing half a pound or less, representing millions of expressions.

It is estimated that 300,000 persons in this country use codes regularly, and some firms pay $100,000 and even $250,000 a year for cabling. Thus the code expert's profesion is important, and it is necessary for him to be able readily to grasp the details of a business when he begins to evolve a code for its requirements.

Codes may be divided into four classes. First, there is the private code, which is written especially for an individual or firm; second, there is the general conversation code, of which thousands are printed, some selling as high as 75,000 copies, and bringing as much profit as a "best selling novel." The first general code of importance was written in 1888, and it has been followed by many others of similar design. Copies of each general code are, of course, identical, and for the buyer to communicate with the seller, or vice versa, it is necessary only for them to agree to use a certain book.

A third type is a public code designed for a specific line of business. There are codes for the grain and timber trades, for mining, and even for the theater.

The fourth type is the blank code made up of code words with blank lines attached, or the numerical system, which enables a person to make a code covering his individual requirements, if he chooses to do so. In speaking of the various classes, a code-maker said:

"The science of coding is made to follow certain vital points. They are economy, secrecy, comprehensiveness, and safety in telegraphing. Safety means the use of words which a telegraph operator can't mutilate easily. In the making of a code, one point or another is frequently sacrificed; for instance, economy for comprehensiveness, or vice versa. In certain businesses, like that of Stock Exchange houses, all points may be subordinated to rapidity. A stock broker's code must be so arranged that the user can readily find what he wants. A message is sent to London, and an answer is received in from three to four minutes; so you will see the necessity for a code that will work quickly."

Before the International Telegraph Conference of 1903, code makers were supposed to use only dictionary words, with a maximum of ten letters, from the English, French, Dutch, Italian, Portuguese, Spanish, and Latin languages. In their compilations they gathered a set number of phrases, which were supposed to cover the general requirements of a business. It will readily be seen that a certain individuality entered into the compilation of general codes, because in their efforts to reduce the bulk of the books authors climinated those phrases which they did not think necessary.

For instance, if an author thought that a phrase in the negative was imperative he would put it in the code, but if he did not consider the affirmative of the same phrase to be imperative he would

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leave it out. If he would have incorporated every expression in the first, second, and third persons, with questions and answers, past, present, and future, negative and affirmative, his code, as thick and heavy as it was, would have reached immense proportions.

The expansion of modern business and the complexity of methods demanded more elastic codes than could be compiled from the dictionary words permitted. Accordingly, the code makers devised spurious words to convey numbers, each giving a meaning or several meanings, which were obtained by consulting a key. By the terms of an international agreement, cable companies were not supposed to accept spurious words except at double rates, but they winked at the regulation and thus compilations of the new type of code were unofficially encouraged.

Nevertheless, the convention of 1903 talked of adopting an official "vocabulary" which would eliminate spurious words for all time, but cablers the world over protested that such action would mean the rewriting of all codes at great expense, and would, moreover, tend to restrict the use of the cable as a business medium. Their point was so well taken that the convention granted code makers the right to use artificial combinations of words instead of dictionary words, and they speedily took advantage of their opportunity.

By a combination of letters or syllables code makers are now able to put into a small volume millions of expressions in the first, second and third persons, with questions and answers, past, present and future, negative and affirmative; indeed, one code of 497 pages contains more than 400,000,000 expressions, or nearly 1,000,000 to a page of forty-seven lines.

There are many ways of maintaining the secrecy of a code, and some are so comprehensive that a message received at 10 A. M. would convey a different meaning if it were received an hour later. It has been found that safety lies in sending a message which means something different from the actual translation. Thus a man who stole a message and was able to make a translation such as "When will you ship?" might readily think that he had the correct meaning, whereas the person to whom it was addressed would read: "Have you made arrangements, etc.,"

The simplest form by which changes like these are made is through a system of preconcerted signals. On Monday, perhaps, a man will know that his signals should be read ten words back, on Tuesday ten words forward. Obviously, an unscrupulous person into whose hands such a message might fall would be unable to make use of it.

Perhaps the smallest codes are those used by stock brokers who deal with foreign clients in about twenty active stocks. Figures instead of words are used, and they cover names of stocks, prices, market conditions, etc., all typewritten or printed on a slip of paper that will fit into a pocketbook.

Cable companies will not accept more than five figures in a group, and expert code men say there is danger in telegraphing numerals, although their use is convenient to brokers who wish to work rapidly. Each single figure of a group has a specific meaning, and should one be changed accidentally by a cable operator the intended message would become another. Consequently, through mutilation a man might buy when he should sell or he might buy at a wrong price.

The cost of compiling codes ranges from $100 to $20,000, and some large corporations are in the possession of private codes for which they have paid from $5,000 upward. An expert code maker, who works in the office of a client, receives, as a rule, $25 for a day of four hours, two hours in the morning and two in the afternoon. He does not work four hours at a stretch, on account of the nervous energy and vitality his calling demands. A house in business from thirty to forty years expects the compiler to incorporate all its requirements in a code within a short space of time, and the strain upon him is therefore heavy. If you ask him, he will say he is underpaid.

In order to insure absolute secrecy in the compilation of its code a firm will sometimes require an affidavit from the code maker, stating that all sheets and papers bearing memorandums have been delivered, and that the type has been destroyed after printing.

Codes are first turned out in typewritten form, and then printed, the total cost being about $10 a page. If the work is extremely technical, or the compiler is compelled to visit another city in pursuing his subject, the cost of producing the whole work is necessarily greater.

Some merchants employ cable clerks who are competent to make codes, and they doubtless save a good deal of money in this way, especially when they are obliged to send a number of copies to correspondents and customers in foreign lands. A West Indian merchant, who, by the way, makes his own codes, and distributes them among his customers, said the other day that he regarded them not only as economical conveniences, but as "getters" of business. "If a man," he said, "forgets to order something by mail, he will not hesitate to use the cable when by doing so he can save time and expend only a dollar or two."

Banking firms and express companies which sell letters of credit also have codes printed for the convenience of their customers, and business men nowadays take their codes to sea with the purpose of sending messages by wireless, in case of necessity.

According to a list recently published the grand total of Mr. Carnegie's gifts to date is $150,000,000. The largest of these is for libraries in the United States, the total being $30,000,000. The donations thus far to the Carnegie Institute of Pittsburg foot up to $16,000,000; another item is $2,000,000 for the "Polytechnic School" in Pittsburg.

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A Wireless Communication from Mars.

A good story is told by Fred. Catlin, of New York, one of the best known of old-time telegraphers. The story for which he is responsible relates to recent wireless telegraphic communication with the planet Mars. Mr. Catlin evidently read an item in a recent issue of Telegraph Age in which it was stated that a French scientific body has offered a prize of $20,000 for any one who would devise a method of communicating with the various planets. The scientists barred the planet Mars on the ground that communication with that planet had already been established by wireless telegraphy. This startling announcement evidently interested Mr. Catlin. He began an investigation to learn how the planet Mars had been reached and who were the fortunate telegraphers intrusted to the care of so important a circuit. He found the solution at one of the wireless telegraph stations not a thousand miles from this city.

The story goes that one evening in the fall of 1907, when the planet Mars was nearer to the earth than it had been for many years, the operator in charge of the station was testing a newly invented receiving apparatus claimed to be much in advance of any of those in use. He was having a pleasant chat with a steamer a couple of thousand miles away when suddenly the circuit was interrupted by frantic calls of "NY!" "NY!" "NY!" followed by the signal "M." No response came and the calls were repeated. After listening a short time the operator broke the circuit and asked: "Who is calling?" Instantly came the response: "Do you hear me? Who are you? This is the planet Mars, answer." When assured that he had at last succeeded in being heard, the distant planetary operator said: "Now hear what I say. For the love of 'Great Mars' don't lose me, don't lose me. Gee! but you're slow down there. Mars was working wireless to Saturn before Morse was known. I have been calling you for years and had given up all hopes of ever making you hear me. Remember me to all of the boys; all of the old-timers know me. I am Hank Cowan. Forty years ago I worked all over the United States. Just wait a minute and I'll cut you through to Jupiter "Ju," and 'Joe' Barley will tell you all about ballooning from Mars, and many other things that will interest you. In the meantime I'll run over to 'Sandy' Spencer's. He has a new joint on Planet Lane and this is opening night. There's Mercury after me on the aerophone. Amos Learned has offered a big prize for the first connection with the Earth for an item for his papers. Call 'Ju' now and I'll see you later."

The message concluded, silence once more reigned, and distant Mars could be observed still glowing in the heavens, yet with a perceptible enlargement of sphere and warmth of color. A closer inspection seemed to reveal even a faint twinkle, significant because in contradistinction to the ordinary stolidity and calm of planetary dignity.

Book Review.

"Creation," an epic poem, by Arthur H. Crain, an operator, a son of Colonel M. D. Crain, night manager of the Western Union Telegraph Company, St. Louis, is a production founded on the Book of Genesis. In four parts, or books, it introduces Adam and Eve in the Garden of Eden; the temptation by Satan is portrayed, the fall of the couple and their expulsion from Paradise is told; the consequent wickedness, sorrow and misery that followed throughout the earth because of the first transgression is depicted, with a culmination finally pictured in the flood which drowned the world, thus closing the first era of human and animal existence save those who escaped in the ark.

"Submarine Telegraphy" is the title of a book issued in pamphlet form, which, although not of recent date, nevertheless supplies a fund of general information on the subject of such a character as to render the work always one of interest and practical value. How full this volume of sixty-four pages and of abundant illustration, treats its subject matter, may be judged from a contemplation of its table of contents which includes the following references: The number of cables; action of cable; means adopted to counteract discharge; principle of mirror galvanometer; connections of cable apparatus; minnotto cell; the syphon recorder of Curtiss; the transmitters of Cuttriss and Wilmot; tests for faults in cables; condensers—description of their quantity and capacity, laws of measurement of capacity and connections of condensers in series and quantity; explanation of the terms tangent; constant of galvanometer; range and divisions of tangent; the controlling magnet; the effect of iron in the coil, or near the galvanometer; direction of lines of force round the coil; the tangent law; the measurement of current and resistance simultaneously; additional Wheatstone bridge tests; loop test for earth when the wires are of unequal resistance; test for distance of a contact; Varley's and Murray's methods; theory of the Wheatstone bridge—comparison with the differential galvanometer; analogy of water pipes; effect of increasing the width of the pipes; description of theoretical diagrams of the bridge; effect of changing the resistance in the arms; proof that the resistance of any arm is equal to the product of the resistances of the adjacent arms divided by that of the fourth arm; formulae for calculating the currents in the arms; resistance to employ in the arms.

The price of this book is seventy-five cents. It will be sent to any point on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Orders, if sent to Telegraph Age, Book Department, for any book required on telegraphy, wireless telegraphy, telephony, electrical subjects, or for any cable code books, will be filled on the day of receipt.

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Retirement of General Greely.

Major General Adolphus W. Greely, United States army, and until between two and three years ago chief signal officer, was placed on the retired list on March 27, that distinguished officer having reached the constitutional age limit of sixty-four years on that date.

Few if any officers of the United States army have enjoyed such a wide measure of fame during recent years as has Gen. Greely. It is now something more than a quarter of a century ago that he attracted world-wide attention by a Polar expedition, of which he was the chief. This expedition sailed northward in 1881. It contained twenty-five members, of whom only seven came back.

Two relief expeditions failed to find the Greely party, and when finally rescued by the third expedition, sent under command of Capt. Winfield S. Schley, the survivors of the party were nearly crazed with hunger. At the time he made this expedition to the Polar seas Gen. Greely was a lieutenant in the Fifth Cavalry. The expedition reached a point further north than any previous record.

Before going to the Arctic, Lieut. Greely had built thousands of miles of military telegraph lines in Texas and the Southwest and had acted as an officer of the Signal Corps, then commanded by Brig.-Gen. Albert J. Myer. The latter organized the corps, which was afterward commanded by Brig.-Gen. W. B. Hazen, and later, following the death of Gen. Hazen, in 1886, by the returned Arctic hero, who had been made a captain in the regular course of regimental promotions in the Fifth Cavalry.

During and after the Spanish war Gen. Greely had a further opportunity to show his great ability as a builder of telegraph lines. Under his immediate direction there were built and operated 1,000 miles in Porto Rico, 3,800 miles in Cuba, 250 miles in China during the Boxer outbreak, and 10,500 miles of lines and cables in the Philippines. He afterward installed a system of 3,900 miles of telegraph lines in Alaska, one of these lines being the first wireless system to be put to commercial use.

One of Gen. Greely's most brilliant achievements was the reorganization on its present efficient basis of the National Weather Bureau. Previous to his incumbency the service was of a most crude and untrustworthy character. He began at once to gather meteorological data from every reliable source, and in the course of time he was able to arrive at something definite. He established a complete system of weather stations in various parts of the country and lifted the service from the plane of ridicule to that of respectability.

General Greely is a native of Newburyport, Mass., where he was born March 27, 1844. He enlisted as a private soldier in 1861, shortly after the breaking out of the Civil War, when but seventeen years of age.

"A Practical Remedy for Neutralizing the Effect of Induction in Telegraph Apparatus."

BY J. F. SLACK, OF BEAUMONT, TEXAS.

I noticed in the April first issue of Telegraph Age, under the heading which I place at the top of this contribution, and which was discussed under the general title of "Some Points in Electricity," a subject which appealed to me very forcibly. As the article seemed to be open for discussion, I herewith offer my experience along just such lines as those described.

After taking charge here as division wire chief, of the Santa Fe system, Ifound that for several years the wires had been badly interrupted at times by what was commonly termed with the operators and despatchers of this division, a cross, but after investigating for myself, I decided that the trouble was induction. I immediately set about to remedy the evil by first ascertaining the cause, which I found to be a high voltage electric light current paralleling our wires for a distance of one hundred and fifty feet from the street to the transformer outside the building; this electric light wire is an alternating current and paralleled our wires within three to six inches. My remedy was immediately effective and without extra cost to the company.

The original telegraph line was on brackets, which I had removed, and the wires were placed on crossarms at a distance not closer than ten feet from the electric light lead. This clearly eliminated the trouble, and I have not been bothered since from that source. I note, however, that the distance Mr. Applegate claims for his circuit was something like thirty or forty miles, while mine was but a few feet, which was much easier to remedy.

The Old Time and Military Telegraphers' Reunion.

The annual reunion of the Old Time Telegraphers' and Historical Association and the Society of the United States Military Telegraph Corps, will meet this year at Niagara Falls, N. Y., on September 16, 17 and 18. This in reality will be the holding of the postponed meeting of 1907, deferred at that time because of the disturbed conditions in telegraph circles. Practically the same programme of entertainment determined upon last year, will be carried out this year, and headquarters will be established at the International-Cataract Hotel, as before designated.

The officers of the Old Time Telegraphers' and Historical Association are: Harvey D. Reynolds, president, Buffalo, N. Y.; George A. Burnett, Buffalo, N. Y.; I. McMichael, Toronto, Ont., and George F. Macdonald, Ottawa, Ont., vice-presidents; John Brant, secretary-treasurer, 195 Broadway, New York.

The officers of the Society of the United States Military Telegraph Corps are: Colonel William B. Wilson, Holmesburg, Philadelphia, president; William L. Ives, New York, vice-president; J. E. Pettit, Chicago, secretary and treasurer.

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Letters From Our Agents.

ST. LOUIS, WESTERN UNION.

The St. Louis Barclay department is to have three more printers, one each with Denver, Omaha and Dallas. It is understood that considerable of the business from Denver and the West which has heretofore gone via Chicago, will be diverted to the St. Louis route.

Superintendent George J. Frankel and General Foreman George E. Sharp are now on a trip of inspection through Arkansas and Missouri.

Chief Operator W. F. Burton, of Nashville, Tenn., made a visit to this office April 3. He was much interested in the Barclay department.

E. L. Dougherty has been placed in charge of the Western Union force at the Globe-Democrat office.

G. W. Schmittgens has been appointed chief of the check force.

E. W. Parmelee, Jr., has been elected manager; D. J. Kelley, captain, and F. E. Patrick, treasurer, of the Western Union Baseball Association.

Charles W. Henry and Miss Mayme Delester Smith, formerly manager of the Western Union at Beardstown, Ill., were married at Jacksonville, April 2.

Among the new subscribers to Telegraph Age are: N. T. Petty, F. S. Rowe, W. A. Wilkerson, W. N. Manley, E. A. Kintz, O. R. Carson, Miss Mildred V. Brunkhorst, M. J. Cassidy, G. A. Riber and M. Tulley.

Everybody here reads the safe and sane Telegraph Age.

NEW YORK NEWS.

Mr. G. W. Hickey, the well-known old-time telegrapher, formerly manager of the Western Union Telegraph Company at Plattsburg, N. Y., and at one time in charge of the Government telegraph in Porto Rico, whose recent marriage was noticed in this column, has returned from a wedding trip South which was extended as far as Florida, and Havana, Cuba.

Miss Mamie G. Smith, employed as telegraph operator by E. and C. Randolph, brokers, New York City, died March 31.

Thomas E. Maddex, whose death was noticed in the April 1 issue, was General Robert E. Lee's operator during the last year of the Civil War, and stood by the side of the Confederate chieftain receiving and sending the last message before Lee surrendered to General Grant, at Appomattox, April 9, 1865. After the conclusion of the war Mr. Maddex worked as a telegrapher in various cities throughout the country until 1897, when he was stricken with paralysis at Washington, from the effects of which he never recovered.

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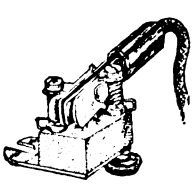

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Wanted—Information as to whereabouts of Operator E. J. Hamilton. Address "S," care Telegraph Age, New York.

Will buy or sell, in one to ten-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

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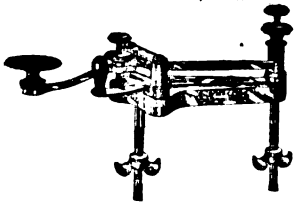

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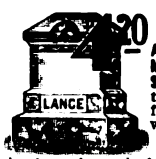

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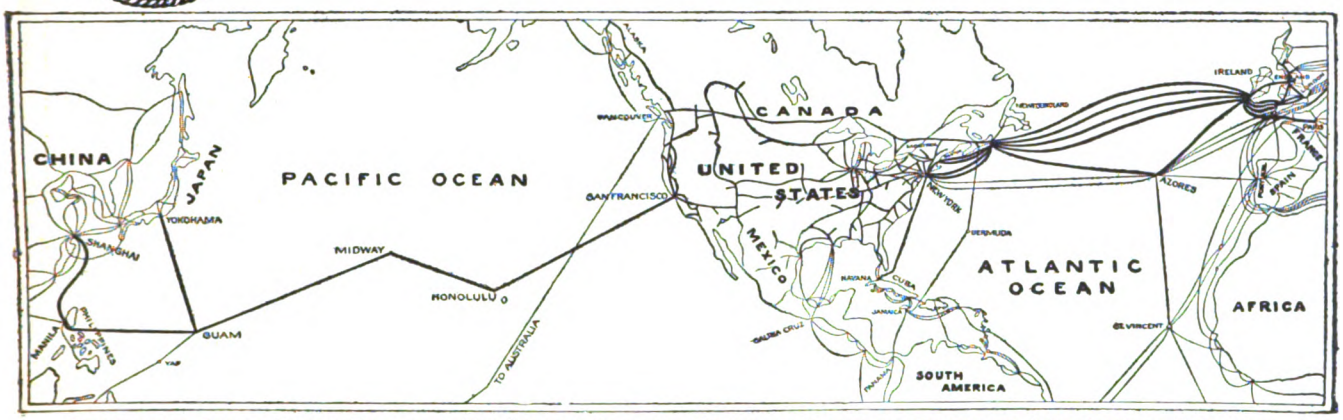

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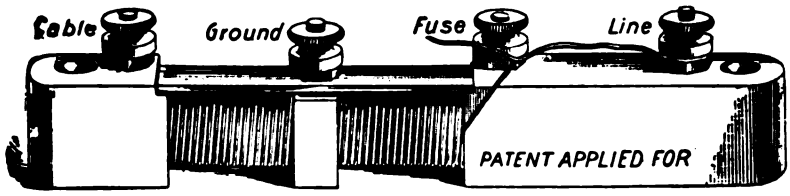

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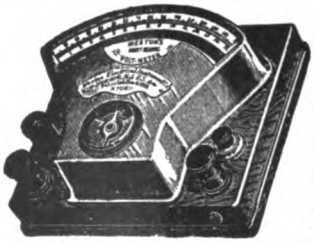

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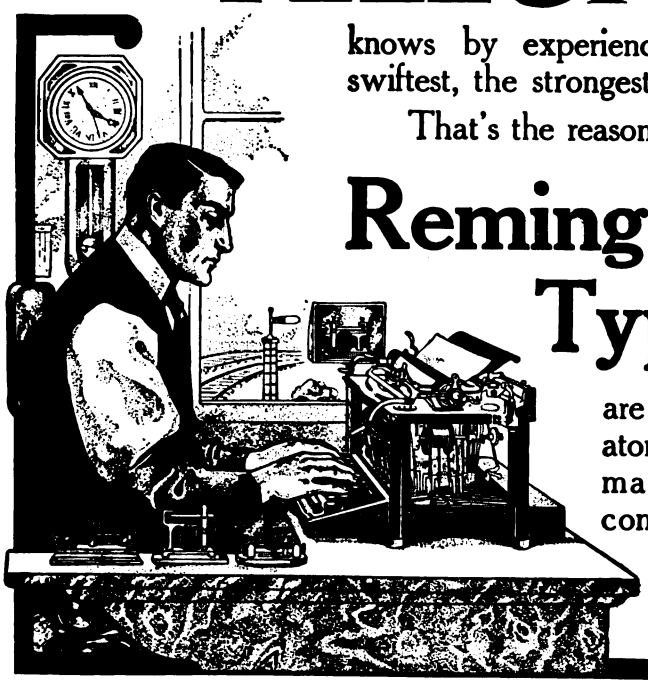

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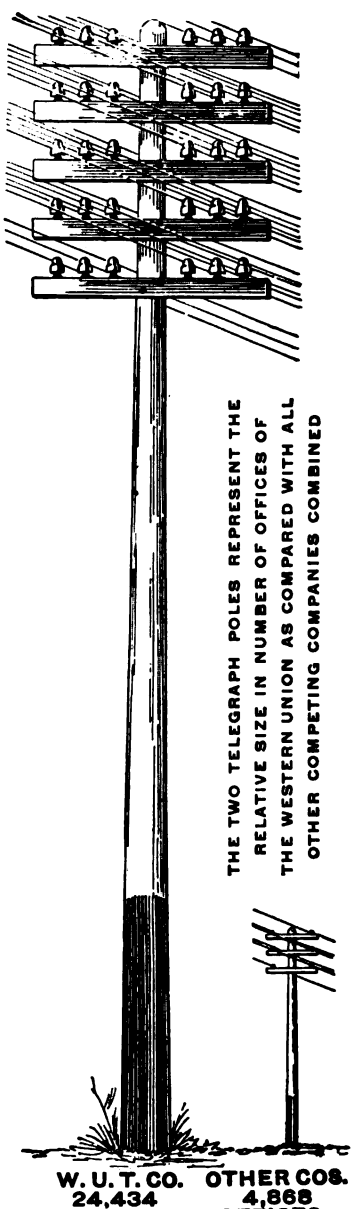

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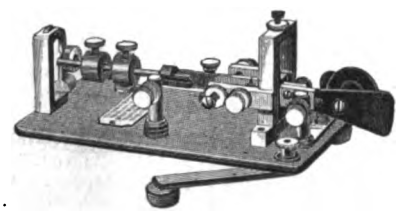

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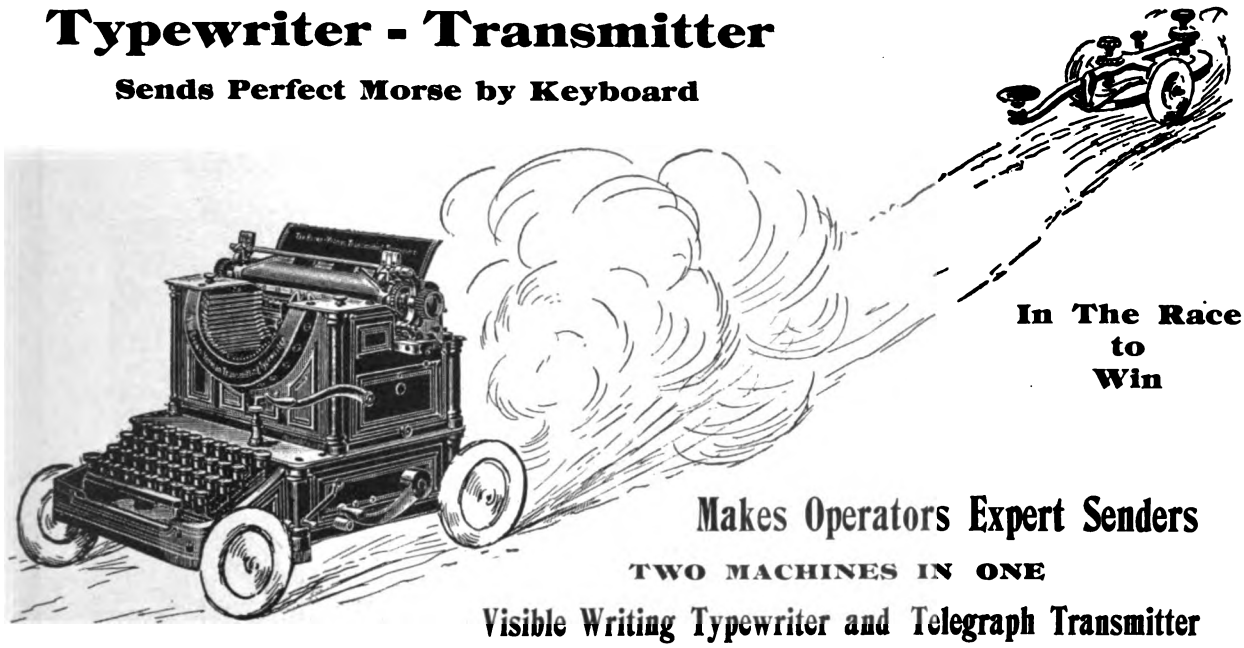

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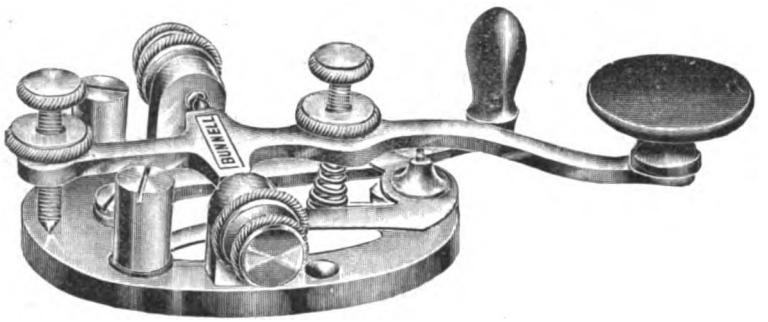

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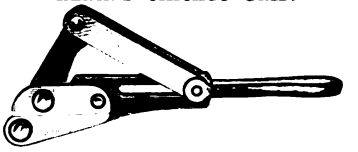

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TELEGRAPH AGE

No. 9. NEW YORK, MAY 1, 1908. Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

The Polar Relay—Its Theoretical and Actual Construction.

BY WILLIS H. JONES.

A correspondent suggests a subject that may be of interest to other readers of this journal, hence the reply will be in the form of an "open letter." He writes:

It appears that in the Siemens or old-style polar relay, the armature is poised on one end of the permanent horseshoe magnet, and that the field or electro-magnets are poised on the other end, a part of this latter end acting also as a helix for the two electro-magnets. It seems that in the Barclay pattern the two field magnets have no helix and that the two ends of the horseshoe magnet are brought around and lie in close proximity to the two pieces of iron on either end of the armature axis. It is our understanding that the absence of a helix in the latter type of relay is compensated for by the fact that there are four pole-pieces instead of two, that the pull exerted on the armature is therefore greater and that the magnets are quicker in their action. Further, we assume that the modified arrangement of the horseshoe magnet is made necessary because it is required that the armature have two poles, one at each end of its axis. Are we correct?

The main object of using a polarized relay is to enable us to work long telegraph circuits successfully where a neutral or nonpolarized instrument would be ineffectual. The construction, therefore, of such a relay must naturally follow a thoroughly scientific process. Problems have to be met and overcome to give results that are both practical and effective.

There are two powerful elements to be taken into very serious consideration, namely, hysterisis and self-induction. The former is that peculiar property of iron which after having been subjected to a magnetic treatment tends to retard its rapid restoration to a normal condition. This trait is particularly aggravated when the magnetic circuit is nearly closed, as is instanced by the fact that when an armature is in actual contact across the magnet poles a very high per-

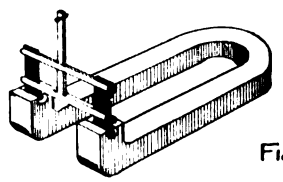

Fig. A

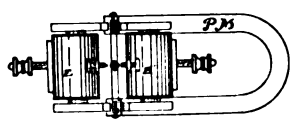

Fig B

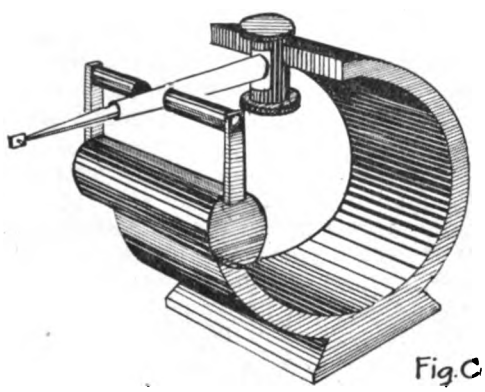

Fig. C

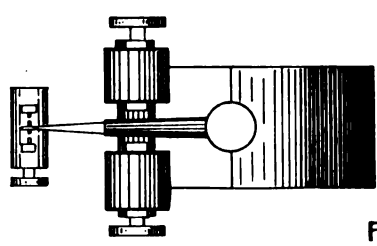

Fig D

centage of the magnetism remains after the current is taken off. Its effects may be materially reduced by the intervention of an airgap and a reduction in the mass of the metal itself.

Self-induction is that property of an electric current which, while the latter is passing around the helix, tends to induce in each contiguous layer of wire in the coil a current which retards the rise of magnetism, just as though the resistance in the coil was, in some way, being in-

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creased; and when the current falls it acts in just the opposite manner. These conditions are met and minimized by removing the yoke and maintaining an airgap, as to hysteresis, while self-induction is nearly cut out by joining the coils in multiples, thus also reducing the time constant.

In the old style camel-back, or Siemens pattern of relay, shown in Figs. C and D of the accompanying illustration, a powerful steel magnet is used having on one end a cross-piece of soft iron carrying the coils or helices. On the other end of this magnet there is extended a tube or flat piece of iron, the remote end of which plays between the pole-pieces of the two relay coils. The cores and pole-pieces are of the best soft iron, and are carefully annealed, all work in their construction being completed before that operation takes place because it has been found that if such cores are hammered, filed, or in any way subjected to injury the best results are not obtained.

Now, in this type of relay, the end of the tubular armature on the permanent horseshoe-shaped magnet is pivoted in such a way as to be free of actual contact with the latter; that is to say, it is pivoted in a brass setting, which latter being non-magnetic by nature, creates the equivalent of an airgap in size equal to the dimensions of the space the setting occupies. The brass, of course, naturally weakens the power of the steel magnet, but it seems to be helpful in permitting a freer movement of the armature than would be possible were the armature and the magnet made continuous by pivoting with an iron or steel setting. The armature is magnetized inductively across the brass setting in a degree sufficient for the purpose desired.

On the other terminal of the permanent magnet, the yoke with the cores form one and the same part of that end of the horseshoe, each core having the same polarity. The lever end of the armature, having, of course, the same polarity as that of the end of the permanent magnet to which it is attached, will naturally cling to either side of the contact points when no line current flows through the coils. When, however, a current does flow, the permanent induced effect in one of the coil cores will be neutralized and the other intensified and thus move the armature as desired.

It is claimed by some that while this style of relay is very efficient it is not quite so well adapted for rapid work as the present flat or Barclay pattern, Figs. A and B, referred to by our correspondent, owing to its construction not being so well adapted as the latter to antagonize the operation of the retarding influences mentioned.

In the Barclay relay there is no yoke or heel-piece to join the two spools together. The cores are milled out of a solid piece of soft iron and in the process of construction the ends or pole extension pieces are left on, thus forming one homogenuous piece. They are then drilled at the ends for screws and entirely completed before being placed in a charcoal fire to be carefully annealed.

The spools are wound with wire in parallel, in some cases; that is, two wires at the same time, and in others in sections. If carefully done the former method is probably the better, but the latter is safer inasmuch as the tendency of the current to jump from one wire to the other is thereby avoided.

The spools are wound to a resistance in each wire of 200 ohms, making 400 ohms for the complete coil. Number 36 single silk-covered wire is used and it requires approximately 928 feet of this gauge for each coil. The variation in the resistances of the two wires should not be more than one per cent. when properly wound. Frequently it is less.

For an automatic or multiplex system where speed is the chief requirement the style of the relay construction is somewhat different, the coils and armature being placed in a vertical position and the moving parts all more delicately constructed, but in other respects the general principle involved is similar to the horizontally fixed coils and armature of the regular pattern.

This relay, generally known as the "Wheatstone" relay, is probably the most perfect form of relay made. The pivot of the vertical armature axis rests on one end, thus reducing the mechanical inertia to a minimum. The coils in this pattern are also longer, and are wound to 300 ohms in each coil, making 600 ohms for both, but they are joined up in multiple, thereby reducing the resistance one-fourth and the time constant to so low a point that the relay responds to a very high speed.

In both of these standard patterns of relay there are four poles and two armatures, the latter on a common shaft, and placed in such a manner that their lower ends are under the control of the permanent steel magnet (see Figs. A and B). As soon as the line current traverses the coils there are two poles repelling and two attracting, but as there are also four airgaps in the magnetic circuit against two in the Siemens pattern, it is hardly probable that the object of such construction is for the purpose of getting the magnetic co-operation of four poles, as suggested, but rather to minimize harmful influences more pronounced in other types.

Recent Telegraph Patents.

A patent, No. 883,723, for electric transmission of intelligence, has been granted to Isidor Kitsee, of Philadelphia. Relates to telegraph and telephone signaling in proximity to a power circuit having inductance effects. Makes use of a special return conductor for the power circuit connected through condensers with the telephone wires so as to neutralize the induction effects therein.

A patent, No. 883,724, for electric transmission of intelligence, has been issued to Isidor Kitsee, of Philadelphia. Relates to modifications of the preceding.

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A patent, No. 884,381, for a telegraph transmitter, has been awarded to Mark S. Haling, of Weaver, Minn. Transmitter of the type making use of two keys fulcrumed on vertical axes and which operate to transmit dots and dashes successively in a continuous succession as long as depressed.

The following patents have expired:

Patent No. 449,655, for telegraphy, held by F. Anderson, of Peekskill, N. Y.

Patent No. 449,897, for telegraphy, held by R. G. Brown, of Brooklyn, N. Y.

Patent No. 450,228, for printing telegraph, held by P. H. Fisk, of New Richland, Minn.

Patent No. 450,272, for a telegraph relay, held by R. O. Wickes, of Troy, N. Y.

Personal.

Mr. Paul Schanher, son of J. Schanher, manager of the Western Union Telegraph Company at Mount Clemens, Mich., was married April 21, at Staunton, Va. His wedding trip is taking him to numerous places in the East, where he has many friends.

Mr. Charles A. Boynton, of Washington, superintendent of the Southern Division of The Associated Press, has had conferred upon him by the Emperor of Japan, through Ambassador Takahira, the decoration of the fourth class of the Imperial Order of the Rising Sun.

Mr. William A. Porteous, manager of the Postal Telegraph-Cable Company at New Orleans and T. P. Cummings, manager of the Western Union Telegraph Company at the same place, were in Washington recently, whither they were summoned by the Congressional committee to testify in the Lilley case.

Readers of Telegraph Age, and especially the members of the United States Military Telegraph Corps, will be pleased to learn that James E. Pettit, secretary of the corps for many years past, has recovered so far from his recent illness as to be able to resume his position of chief operator in the Chicago office of the Postal Telegraph-Cable Company.

The Electrical Review recently published a picture showing a group of pioneer telephone officials of the American Bell Telephone Company, taken in 1882. These included Theodore N. Vail, Thomas B. Doolittle, O. E. Madden, Robert S. Boyd, Frank B. Knight, Charles R. Truex and J. M. Brown. Of this number Mr. Vail, the first general manager of the early telephone company, and who is now the president of the American Telephone and Telegraph Company, at New York, was a former telegrapher. Thomas B. Doolittle and Frank B. Knight likewise belonged to the telegraphic profession. These last-named gentlemen are still in the telephone business, the former being located at Boston, and the latter at Dallas, Texas.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. Charles H. Murphy, manager of time service of the Eastern division, was in Boston last week on business connected with his department. The extension of the time service in the Eastern division of late has been rapid, the installation of numerous clocks being added to the already large equipment at all points in the service.

William Finn, of the electrical engineer's office, has been confined to his home for some time past, his trouble being due to a carbuncle.

Mr. James McParlan, manager of the marine department, who was recently South on a leave of absence for the benefit of his health, has returned.

The company is installing a storage battery plant in its office at Ashland, Ore.

The income account and balance sheet of the American District Telegraph Company of New Jersey makes this comparative showing:

Year Dec. 31,	1907.	1906.	1905.
Gross	$3,017,174	$2,799,624	$2,534,698
Expenses	2,304,214	2,083,798	1,842,879
Net	$712,960	$715,826	$691,819
Dividends	396,899	392,951	390,049
Surplus	$316,061	$322,875	$301,770
Prev. surplus	930,509	721,942	55,871
Total surp.	$1,246,570	$1,044,817	$357,641

Since organization the company has expended, chiefly out of earnings and bond money:

For new construction	$1,211,119
For purchasing stocks and business of other companies	500,961
For franchises and sundry advances	37,881
Total	$1,749,961

The general balance sheet as of December 31, follows:

ASSETS.

Dec. 31,	1907.	1906.
Plt., fran., stks., pat., etc.	$9,653,933	$9,653,934
Cap. account	1,780,603	1,346,696
Supplies	67,583	69,988
Cash	123,660	135,909
Accts. rec.	37,279	130,902
	$11,673,058	$11,337,429

LIABILITIES.

Capital stock	$9,925,350	$9,909,851
P. and L. surplus	1,244,943	930,510
Bonds payable	283,000	272,000
Sundry acct. payable	219,764	225,068
Total	$11,673,059	$11,337,429

RESIGNATIONS AND APPOINTMENTS.

Mr. Norman Ringer, manager at Colorado Springs, Colo., has been transferred in the same capacity to El Paso, Tex.

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Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Edward J. Nally, vice-president and general manager of the company, who has returned from an extended business trip in the West, undertaken in the interests of the company, was the recipient on April 8, while at San Francisco, in recognition of the first anniversary of his appointment as general manager, of the following telegram, signed by Clarence H. Mackay, president of the company:

> The finance committee wishes me to express its sincere appreciation of the good work you are doing in inspiring the force with the spirit of our company in the way of improving the service and bringing about economies in operation. We are in thorough accord with your management, policy and administration, and I am sending a copy of this telegram to all our superintendents.

Mr. Charles C. Adams, second vice-president of the company, together with F. H. Hollenbeck, of his office, recently returned from a Southern business trip, which covered all points as far as New Orleans. Mr. Hollenbeck accompanied Mr. Adams in the capacity of secretary.

It is of interest to recall the fact that Charles P. Bruch, third vice-president of the company, was elected just twenty years ago, the first president of the Magnetic Club, then just organized. Included among the guests at the first banquet held at that time were the late James D. Reid, the "father of the telegraph," and Erastus Wiman, then president of the Great North Western Telegraph Company.

Mr. H. F. Hawkins, assistant secretary of the company, who accompanied Mr. Nally on his recent Western trip, returned with the latter and is once again at his desk.

Mr. William A. Porteous, manager of the office at New Orleans, was a recent visitor.

Mr. F. H. Austin, chief operator in the Mobile, Ala., office, was married April 15 to Miss Margaret Waddell, formerly of Philadelphia.

The new office of the company at Pittsburg, described at length in the April 1 issue of Telegraph Age, the execution of the plans of which has been conducted mainly under the direction of F. E.d'Humy, of New York, assistant electrical engineer of the company, was occupied on April 25.

The Railroad.

Statistics compiled by the Interstate Commerce Commission, and published by the Railroad Gazette, states the salient fact that there are now a dozen railroads on which the Morse telegraph is no longer supreme in manual block signaling, telephones or electric bells being used.

The convention of the Railway Telegraph Superintendents which will take place during the four days of June 24, 25, 26, and 27, at Montreal, Que., gives promise of being well attended. Many details relative to the convention were published in Telegraph Age, April 1. Any further information that may be required relative to the affair, may be obtained of P. W. Drew, secretary of the association, and who is the superintendent of telegraph of the Wisconsin Central Railway, Chicago, Ill.

The Canadian Pacific Railroad has installed a telephone circuit between Calgary and Medicine Hat, a distance of one hundred and seventy-eight miles, on two two hundred and ten-pound copper wires, worked duplex between Calgary and Winnipeg, eight hundred and forty miles. This is precisely the come combination as between Montreal and North Bay.

Suit was instituted by the state at Milwaukee against the Chicago, Milwaukee and St. Paul Railway Company to test the eight-hour law passed by the Wisconsin legislature, which, it has been charged, conflicts with the new federal nine-hour law. The case of Edward A. McGrath, station agent at Stowell, employed in the dual capacity of agent and operator, and required to work from 8 A. M. to 8 P. M., was used as a basis for the suit. It was the contention of the attorneys for the railroad company that the state has a right to regulate the hours of railroad employes in the absence of a federal law. As soon, however, as a federal law is passed the state law becomes invalid. In its answer the railroad company declares that but a small proportion of the duties of Station Agent McGrath affected commerce within the state. It held that the state cannot interfere with the hours in which he is employed affecting interstate commerce. It alleges that none of its telegraphers or despatchers have in a period of twelve hours consumed more than one hour in work affecting the movement of intrastate commerce only. The answer brands the Wisconsin law as class legislation, alleging that all other common carriers are placed in a favored class by its operation. On all points raised by the demurrer the contentions of the state are sustained. The case has been appealed to the Supreme Court and the request made that it be advanced in the calendar in order to insure early adjudication.

The question of moving trains by telephone is gaining wide consideration in this country, as the feasibility of such despatching becomes more and more manifest as the result of trial. While the method is still largely in the experimental stage, vet enough has already been accomplished to demonstrate its apparent entire practicability. So much so is this the case that initiatory movements of this kind are being numerously undertaken. The matter of detail governing such form of despatching has become an interesting subject, and has caused many letters of inquiry relative thereto to be addressed to this journal. In a note received from U. J. Fry, superintendent of telegraph of the Chicago, Milwaukee and St. Paul Railway Company, at Milwaukee, Wis., on this subject, he writes: "We are moving trains by telephone only in a small way as yet. We are now arranging to equip two divisions, one of

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eighty-five miles, extending from Chicago to Milwaukee, and another, of one hundred and thirty-eight miles, from Chicago to Savanna, on which trains will be moved by telephone, in precisely the same manner as is being done by the Chicago, Burlington and Quincy Railroad Company. These systems will not go into service for perhaps thirty to forty-five days. All orders, when received by conductors, are written on blank forms prepared for that purpose. In fact, the orders are handled as nearly as possible in our regular way, except that they are handled by telephone."

The Burlington method of train despatching, referred to is described by W. W. Ryder, of Chicago, superintendent of telegraph of the Chicago, Burlington and Quincy Railroad Company, as follows:

"In handling train orders by telephone, the same general methods are observed as with the telegraph, except that the despatcher instead of sending the order and then copying it in the order book on the first repetition, now copies the order in the book as he talks it off. He thus gauges his speed of conversation to his ability to write, so preventing the operators being crowded beyond their ability to make clean legible copies. All figures in the body of the order are spelled out, as for instance, 'Engine 1124—one, one, two four,' and on single-track installations, the names of the towns are also spelled out as well. The operators in repeating the orders observe the same rules as regards spelling out of figures and names. At unimportant stations, particularly at night, where we do not have business enough to warrant keeping an operator on duty, we arrange a set of telephone instruments so that the train conductor can, if necessary, communicate direct with the despatcher and can get an order covering further movement of his train if desirable. When this is done he follows the same methods as do the operators, and in every case a written copy of the train order is in the hands of the train conductor and engineer."

The Cable.

Cable communication is interrupted April 27, with:

Venezuela	Jan. 12, 1906.
Hayti	Jan. 18, 1908.
All offices closed to International traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.	
Madura Island (Dutch East Indies)	Feb. 3, 1908

Considerable trouble is being caused to the Alaska telegraph cable by earthquakes and volcanic disturbances. The cable steamer Burnside has recently discovered two breaks north of Sitka, within a few miles of each other. The damage to the cable between Valdez and Sitka is greater than was at first supposed. A new and active volcano is reported in the vicinity of Valdez. In repairing some of the breaks near Valdez the ends of the cable were found to be buried deep in the volcanic overflow.

Daniel Morrison, formerly of the Canso, N. S., station of the Commercial Cable Company, but for the past five years with the Commercial Pacific Cable Company at Midway Island, is spending a vacation in New York, and will leave shortly for Scotland. It is probable that on his return to this country he will go back again to the Midway station. It is a notable fact that during the first five years of the existence of the Commercial Pacific cable, which was opened for traffic in April, 1903, no serious mishaps have befallen any employe at the several stations of the company, whether at Manila, Guam, Midway, or Honolulu.

The English Underground Telegraph.

In the way of immunity from breakdown and interruption of telegraphic and telephonic communication, great things have been prophesied for the system of underground cables, says Electricity of London, which the post office is gradually introducing between the more important towns to take the place of the overhead lines, which suffer such widespread damage with every storm which passes over these islands. If report speak truly, however, the underground cable is itself not so absolutely immune from breakdown or damage as one might have anticipated, or it may be that the department is passing through an unlucky phase of its experience with buried conductors. Only the other week a post office cable breakdown was reported from Scotland; and now it is noted that the new cable laid for the department between Exeter and Taunton has been condemned.

Then, again, there is the extraordinary affair at Conway, in which a cable, containing the underground trunk wires from Valentia and Holyhead to London, was disconnected by a corporation workman. According to the postmaster-general's report it seems that in process of excavation a post office joint-box was exposed by the corporation gang, whose foreman—without communicating with the local post office officials—took it upon himself to dig up the box, and cut away the lead covered cable on either side. It is alleged that this proceeding was carried out on the strength of information furnished by a passer-by, to the effect that the cable had been abandoned by the post office. As may be imagined, much difficulty and loss of time and revenue were experienced in effecting the necessary repairs, the cable consisting of some twenty-seven conductors. The incident serves to illustrate the importance of preparing and maintaining an accurate map showing the position of all underground mains, telegraph and telephone wires, and such like, in any populous center, and, further, of ensuring a proper study of that portion of such a map relating to a particular district before workmen of any kind are permitted to break ground.

This is a good time to begin a subscription to Telegraph Age, $1.50 a year.

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Radio-Telegraphy.

Patents Nos. 884,070 and 884,071, for space telegraphy, have been awarded to Sewall Cabot, of Brookline, Mass.

A patent, No. 884,076, for space telegraphy, has been issued to Ernest R. Cram, of Cambridge, Mass.

Patents Nos. 884,106 to 884,110, inclusive, for space telegraphy, have been taken out by John S. Stone of Cambridge, Mass.

Patents Nos. 884,986, 884,987 and 884,989, for wireless telegraphy, have been granted to Guglielmo Marconi, of London, England, assignor to Marconi Wireless Telegraph Company, of America.

A patent, No. 884,988, for detecting electrical oscillations, has been awarded to Guglielmo Marconi, of London, England, assignor to Marconi Wireless Telegraph Company of America.

From Rome it is reported that preliminary steps have been taken in connection with the establishment of a series of wireless telegraph stations along the Benadir coast. The station at Mogadoxo is to have a range of about 1,800 miles.

Wireless telegraph experts are engaged in constructing near Zlatoust, Russia, an extensive wireless telegraph station with a view to effecting communication between St. Petersburg and Vladivostock, and also between these two points and Kassatoov, the highest point of the Ural mountains, near Zlatoust, where the Russian government's iron and steel works are situated.

The Suez Canal Company has decided in future to include the spaces intended to hold the apparatus of wireless telegraphy and the electric projector of the vessels among the spaces deducted from the gross tonnage as being useful for the manuever of the vessel, and under reserve of the observation of the maximum total of five per cent. of the gross tonnage.

A London despatch announces still another in addition to the many systems which have been proposed for the wireless control for torpedoes. In this case the inventor is Grendell Matthews, who says that by his system a torpedo can be controlled absolutely up to a distance of seven and a quarter miles, and can be exploded either by concussion or by means of wireless. The same inventor asserts that he has discovered "an electrical wave which cannot be interfered with."

The Poulsen wireless telegraph station, situated at Lyngby, near Copenhagen, Denmark, was recently enlarged, the height of the aerial being increased. This station is in communication with Newcastle, England; Berlin, Germany, and St. Petersburg, Russia. The generating plant consists of a gasoline engine coupled to a ten-kilowatt dynamo, which supplies energy to a single arc-gap. To supply the inert gas, with which the arc is surrounded, a few drops of alcohol are introduced into the arc-chamber every second. This renders the use of a complicated hydrogen generator unnecessary.

The Marconi Wireless Telegraph Company of America has issued a financial statement for the year ended January 31, 1908. This statement shows the following assets and liabilities: Assets—Patents, good will, etc., $5,491,885; stations and experimental work, $126,968; apparatus on hand, $16,853; accounts receivable, $17,946; cash, $1,757; treasury stock, $145,200; furniture and fixtures, $1,060; organization expenses, salaries, etc., $422,422. Liabilities—Capital stock, $6,044,800; Marconi Wireless Telegraph Company of London, $16,281; accounts payable, $8,763; notes payable, $9,600.

At the annual meeting of the Marconi Wireless Telegraph Company of America held in New York on April 21, the following officers were elected: John W. Griggs, of New Jersey, president; Guglielmo Marconi and John Bottomly, the latter general manager, vice-presidents; W. W. Bradfield, treasurer; George S. De Sousa, assistant treasurer. The new executive committee includes the president and vice-presidents and John D. Oppe, James M. Townsend and James W. Pyke. The following were elected directors for five years: John W. Griggs, John D. Oppe, of Montreal, and James M. Townsend, of New York.

A proposal has been made to the Academy of Sciences at Paris by M. de la Grye for giving simultaneous wireless signals at noon and midnight (Greenwich time) to all ships fitted with wireless apparatus. M. Grye points out that the Eiffel Tower wireless station, from a height of about 900 feet, has a zone of communication embracing most of the Mediterranean and part of the Atlantic, and if a great wireless station were erected on the highest point of Teneriffe it would have within its radius the greater part of the world's water surface. The academy has appointed a special commission to examine the possibility of the scheme.

Announcement is made that a new corporation has been formed in Detroit to be known as the Great Lakes Radio Telegraph Company, which will establish over two hundred wireless telegraph stations around the great lakes this summer. According to information the service will be so complete that any interior city or village in Michigan can be in instant touch with any craft which sails the lakes when the new system is installed. Many owners have already placed orders for equipping boats with the wireless attachment that constant communication may be had with the vessels during the entire season. One of the features of the wireless system will be the fact that all vessels will be in constant touch with the weather stations along the coast, issuing them a warning against sudden changes in weather conditions, and especially against dangerous gales.

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R. Rüdenburg, says the Electrical World, publishes an account of a laboratory investigation into the conditions under which electric waves used in wireless telegraphy are absorbed. His results emphasize the hopelessness of transmitting energy by wireless means in a quantitative manner. The dissipation is enormous even in the best systems. The amount of energy absorbed from a given wave is proportional to the square of its wave length so that there is a rapid increase of efficiency on lengthening the waves. On the other hand, the somewhat surprising conclusion is arrived at that the effective length of the antenna is without any influence upon the proportion of energy absorbed. This, however, appears not to apply rigidly to a single vertical antenna. It does apply to the "umbrella" form of receiving antenna, whose effective length is about half the height, since downward currents along the ribs reduce the radiation from the vertical wire. The author gives some diagrams illustrating the distortion of the wave-train by a receiving antenna. This distortion extends over about twenty-four wave-lengths. The area from which energy is absorbed has a radius equal to about one-fifth of the wave-length.

Obituary.

Harry H. Lee, aged forty-three years, an Associated Press operator, died at Oklahoma City, Okla., on April 4. He was a native of Cassopolis, Mich.

Henry Roswell Heath, aged sixty-three years, a veteran of the Civil War, died in Brooklyn on April 19. He was at one time president of The Peoples District Telegraph Company.

William Heinze, aged fifty years, a Dominion Yukon telegraph operator, temporarily alone in charge of an office situated at the furthermost north point of the system in the Yukon country, and distant thirty-eight miles from his nearest neighbor, committed suicide on April 2.

Charles H. Stancliff, aged sixty-nine years, formerly and for many years manager of the Western Union Telegraph Company, at Waterbury, Conn., died on April 14. Mr. Stancliff's father was the first manager at Hartford of the old House printing telegraph system, the first telegraph line built through New England.

John Vandercook, aged thirty-four years, president of The United Press Associations, New York, died of appendicitis, in Chicago, April 11. He represented press associations abroad for over five years and was an author of some prominence. Out of respect to his memory the telegraph instruments in all United Press offices throughout its system were silent for a period of fifteen minutes, from 3 o'clock until 3.15 on the afternoon of April 13, the day of the funeral.

The body of Patrick H. Hughes, a telegraph operator in the employ of the Baltimore and Ohio Railroad Company, Baltimore, was found floating in the harbor at that point, April 9, but whether his death resulted from accident, suicide or murder, is not known. He was fifty-two years of age. He was well known in the South as a commercial, railroad and press operator, and for a number of years was manager of the Postal Telegraph-Cable Company at Raleigh, N. C., at Savannah, Ga., and at other points.

William A. Case, fifty-two years of age, a prominent telegrapher of Pittsburg, employed in a broker's office in that city, died April 14, of pneumonia. He was born at West Newton, Pa., Oct. 21, 1855. He was well known in the profession throughout the country, by reason of his regular attendance at the annual meetings of the Old Time Telegraphers' and Historical Association, at which he was invariably accompanied by his wife and daughter, who survive him. He had been a resident of Pittsburg for thirty-one years, five of which were associated with the Pittsburg Post, two as manager at the Oil Exchange, ten with the Western Union Telegraph Company, while he had filled his late position for fifteen years.

The Value of Local Rural Telephony.

On rural telephone lines a number of telephones, sometimes ten or more, are connected with a single wire. Each subscriber has a different ring or "call," and the wires are in use nearly all the time. The uses to which these rural lines are put are almost innumerable. On the rural lines in some states a daily telephone news service has been inaugurated. Twice a day, at noon and 7 o'clock, in response to a given signal, all the farmers on the rural telephone lines pick up the receivers, and the operator at the central office or switching station reads a brief summary of the principal news items of the day, just received by telegraph from market centers. In this way farmers living twenty and thirty miles from the nearest railroad or telegraph station receive the news of the world almost as quickly as dwellers in the great cities.

The idea has proved most popular, and is spreading. In a number of instances the telephone lines have been connected with the school houses. While the news is being received the children are given a recess, after which the teacher imparts to her pupils the news she has just received by telegraphic transmission from every quarter of the globe.

Business Notice.

John A. Hulit and Company, of 418 Kansas avenue, Topeka, Kan., are advertising a telegraph key designed for attachment to typewriter keyboards, to which the attention of readers is directed. This key is intended to replace the long reach back of the machine to break, a mere motion of the finger being all that is required to secure this result. Many of these keys are in use throughout the country, and appear to be giving satisfaction. Mr. Hulit, who himself is an old telegrapher, invites correspondence with his firm.

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Press Associations' Annual Meetings.

The newspaper men of the United States holding membership in the several press associations of the country namely, The Associated Press, The American Newspaper Publishers' Association, and the Daily Club, the latter an advertising adjunct of the previous named, this being its first annual assembly, turned out in great number last week to meet in their respective annual conventions in New York.

The Associated Press celebrated its ninth annual meeting behind closed doors at the Waldorf-Astoria, on April 21, Frank B. Noyes, president, in the chair. A report by the directors was submitted in which reference was made to the change of date in holding the annual meeting from the third Wednesday in September to the Tuesday preceding the fourth Thursday in April, as well as to end the fiscal year on December 31 of each year, instead of on June 30, as heretofore, changes determined upon at the last annual meeting held on September 28, 1907. During the six months past, twenty-eight new members joined the association and there were thirty-five resignations and withdrawals.

Melville E. Stone, the general manager, in his report for the six months ended December 31, 1907, the change in the date of the fiscal year causing the report to be made for six months only, announced a net deficit of $94,708.03. The total number of leased wires extends over nearly 40,000 miles.

The report of the auditing committee showed the total assets to be $376,614.73. The total gross earnings were $1,276,670.62.

The total operating expenses were $1,368,826.48, of which $146,862.41 was for the foreign news service, $171,351,44 for salaries and $57,375.08 for office expenses.

The leased wire service cost $909,149.24 and the incoming news service, $62,449.74.

The loss incurred during the six months was almost wholly due to the strike of the telegraph operators. The expenses of the leased wire system was very largely increased for this reason.

There are three hundred and sixty-two morning and four hundred and thirty-eight evening newspapers having franchises in The Associated Press.

The newly elected board of directors met in the main offices of The Associated Press April 22, and re-elected as president Frank B. Noyes, Chicago Record-Herald; first vice-president, Charles Hopkins Clark, Hartford Courant; second vice-president, Rufus N. Rhoades, Birmingham News; secretary, Melville E. Stone; assistant secretary, Charles S. Diehl, of Chicago, and Herman Ridder, New York Staatz-Zeitung.

The combination banquet of The Associated Press and of The American Newspaper Publishers' Association was held in the grand ballroom of the Waldorf-Astoria on Wednesday evening, April 22. It was numerously attended and was a brilliant affair. Among the speakers on the occasion was William Jennings Bryan.

United States Military Telegraph Legislation.

Prompted by the perusal of a letter addressed by David Homer Bates, of New York, to Hon. Sereno Payne, House of Representatives, Washington, under date of March 2, and published in Telegraph Age on April 1, respecting national legislation in behalf of recognizing the few remaining members of the United States Military Telegraph Corps to the extent of placing them on the pension roll of the country in equality with the soldiers of the army who fought during the Civil War, Jesse H. Robinson, of Washington, himself a military telegraph veteran, sent the following letter to Mr. Payne on April 8:

Relative to your letter of March 16, 1908, to Mr. D. H. Bates, 658 Broadway, New York, I beg to submit the following facts relative to some of the duties performed by the operators belonging to the United States Military Telegraph Corps during the Civil War, and hope that after reading the same your opinion will change, as did that of the late Senator Orville H. Platt, of Connecticut, who told me shortly before he died that he opposed the bill to pension military telegraph operators for about the same reasons given by you, but after looking into the merits of their claims he was willing to change his former opinions.

After reading General Locke's article relative to his operator, I would say those of us who have participated in active warfare can recall the awful carnage created by concealed explosives, and the terror with which soldiers have advanced over ground mined with torpedoes, and those of us who have not done so may recall incidents where a single individual has rushed through fire and flame, carried out kegs of powder, thinking not of the danger to himself, but of saving the lives and property of others. Such men the world usually classes as heroes worthy of the highest reward and honor.

General Locke, in an article in the Century Magazine, says: "When we came to evacuated camps our soldiers in line of battle were halted and the military telegraph operator, on account of his familiarity with electrical wires, was sent in advance of the troops for the purpose of discovering hidden torpodoes, and, if possible, prevent their explosion while our troops were directly over them."

At Yorktown, in 1862, Mr. Lathrop, the military telegraph operator, who was sent by General Locke in advance of his halted troops, was blown to atoms by one of General Magruder's concealed torpedoes. His remains were scraped up and thrown into a pine box and buried on the battle field. In this instance Mr. Lathrop was sacrificed that the lives of hundreds of commissioned and enlisted soldiers might be spared, yet to this date neither his relatives nor the surviving members of the United States Military Telegraph Corps have received any recognition of this act or, indeed, of the many other similar services rendered.

I am satisfied you would prefer to do that which is right, and if you will get and read Senate Report 1927, second session, 58th Congress, to accompany S., 982, your kindness of heart will lead you to see the proper side of this question. Senate 982 of the 58th, Congress unanimously passed the Senate, but was killed in the House.

The municipality of Asbury Park, N. J., is in high dudgeon because the Postal Telegraph-Cable Company refuses to transmit the city messages free of charge, and in consequence a motion has been made in the common council that the franchise of the company in that metropolitan center be revoked.

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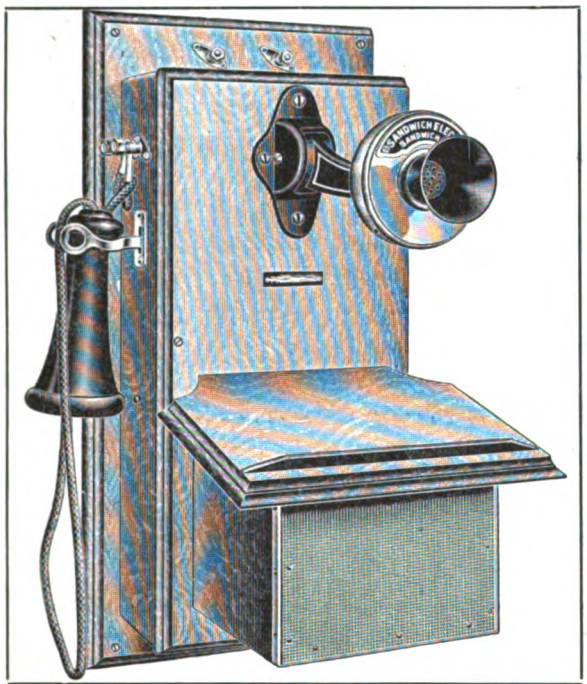
Railway Composite Apparatus



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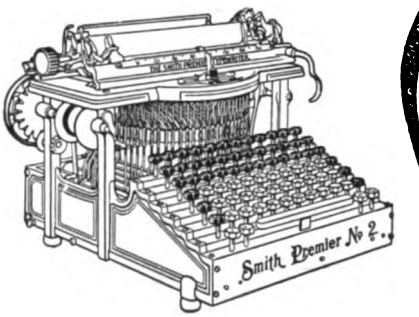

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NEW YORK, MAY 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we have sometimes in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas, in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum named or even more. The growing value of complete files of Telegraph Age should cause our readers to carefully preserve their issues.

A Threatened Strike.

Again, as early in the year, threats of another strike of telegraphers is intimated as likely to occur. In the first instance the menacing utterance appeared to emanate from Chicago, and March 1 was named as a probable date of walk out; now, an official of the union located here in New York, appears to be sounding the initiative in the matter, and June 1 is set for the time when trouble may be expected. At present the animus of the union, the personnel of which evidently is made up largely of the unemployed, seems to be directed against the Western Union Telegraph Company exclusively, because, as alleged, of a cut made in the salaries of operators, which in due time, according to programme, the company will be called upon to restore, or submit to the retaliatory measure of a strike. It is stated that numerous locals situated in different parts of the country, have already signified their approval of the action contemplated, and that others, soon to vote on the question, will probably also render a decision favorable to the proceeding. Unless a bluff is intended it would seem that a deliberate purpose is being shaped, and that the melancholy experience of last year may be repeated this. If so, this would indicate that the madness that produced one strike is to be responsible for an insane frenzy that would cause another. It is not probable that any wrongs that may exist in the present relations between the telegraph company and its employes can be righted or regulated or mitigated in any way by a strike. This should be so obvious to the union leaders and to all members of the union, as to render any extended argument concerning the utter futility of such a proposition wholly unnecessary. The men who went on strike last year are themselves largely to blame for the conditions affecting labor within the limit of the telegraph. If all sense has not departed from their councils they should at least have some dim perception that this year, of all years, is a pretty bad one to inaugurate a striking propaganda. A yawning chasm of utter oblivion, so far as telegraph employ is concerned, doubtless awaits all who would be foolish enough to identify themselves with so offensive a move as a strike at this time would be regarded by all business interests of this country. No circumstance can excuse the folly and wickedness of such an agitation.

The Importance of Legible Copy.

Is good penmanship a lost art among telegraph operators? The need of producing legible copy in order to guard against mistakes in the telegraph service, is obvious; moreover, the satisfaction to the individual of doing a thing properly should be equally manifest. "Neatness and despatch" may well compound a phrase peculiarly adapted to the telegraph fraternity. Its application indicating a willingness to do things right, in accordance with rule and official desire, as well as a following out of the best there is in traditionary inspiration, would go a long way toward making the position of the operator more consonant with dignity, with devotion to duty, the inherent underlying motives that should be the governing impulses of every ambitious person.

Deterioration in penmanship has come to be a glaring fault in the telegraph office. Many an

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elderly operator will produce a chirography, accompanied with proper punctuation, that would put the majority of the younger members of the fraternity to blush. Telegraph operators owe it to themselves, as well as to the profession to which they belong—to the proper observance of the relations they sustain to the telegraph companies and to the public, which, it may be said, they equally serve, to exercise greater care in their handwriting. It is important that they should do so, for carelessness and consequent illegibility in this respect too frequently cause error.

The telegraph companies for years past have found it necessary as a rule to insist upon their operators using the typewriter in receiving messages. The reason for this grew out of the fact that the handwriting in very many of the messages could not be readily or correctly read without more or less study of the faultily constructed letters. While the typewritten message presents a distinct improvement over the defective pen-written telegram, because of its mechanical execution, carelessness of performance is still too plainly the rule rather than the exception in telegraphic work. This is deplorable because it indicates the careless, if not indifferent, mind behind it all.

In a conversation held with an official of one of the telegraph companies a few days ago, the information was furnished that the percentage of illegible copy turned out by operators was remarkably high. He said that his company did not necessarily require its operators to use the typewriter if their writing was legible, but its use was insisted upon by all who were not good penmen. If the individual operator could only be made to realize that success in his chosen occupation was largely dependent upon the faithful attention paid to details, in which the turning out of good copy is by no means the least, he would master one important feature, and relieve himself of much objectionable criticism. All that is necessary to overcome this particular fault is practice. When, for instance, the letter "a" is written, it should be so carefully done as not to puzzle the reader as to whether it might be "o," "u," or "n." Practice alone can make perfect, hence the practice in the formation of each letter should be followed after an acceptable model until words can be written not only rapidly but with strict accuracy. It may not be generally understood, perhaps not believed, but it is a fact nevertheless that it requires no longer time to write letters and words correctly than it does to form them in a slipshod fashion, thus defying their ready interpretation. Errors may frequently be avoided if necessary attention be given to the preparation of legible copy.

This is not a small thing to which Telegraph Age has called attention. It affects the standing of operators in the service far more vitally than many imagine. As was remarked in a previous article, in which this subject was touched upon, some may claim that the turning out of either a well-written or of a poorly inscribed message is a comparatively small thing. Nothing is small or unimportant that has a tendency to invalidate in any manner the work of the individual, be he an operator or otherwise. If the little things of life are closely looked after and their faults overcome, the larger measures, with broader responsibilities, carrying increased emoluments, to which all should aspire, will be more easily reached because of the self-imposed discipline expended in the fundamentals. A man's vision should extend beyond his daily work.

Control of Common Carriers by the Interstate Commerce Commission.

We have frequently stated that it would be better for the telegraph companies to come under regulation, if, indeed, regulation be deemed necessary, by the United States government, rather than by forty odd individual state legislatures, each eager to administer its own idiosyncratic views of what should constitute such "regulation." Theodore N. Vail, president of the American Telephone and Telegraph Company, evidently recognizing the trend of current public opinion in this matter of regulation, stated recently that he saw no objection to government control of the telephone provided it is "independent, intelligent, considerate, thorough and just, recognizing, as does the Interstate Commerce Commission in its report recently issued, that capital is entitled to its fair return and good management or enterprise to its rewards." So, too, with the telegraph, if control be vested in the Interstate Commerce Commission, such action would tend to simplyfy and overcome many vexatious questions imposed by too much and too varied legislation on the part of the several states. It is not a difficult matter to deal with one central body of men of broad sympathies and jurisdiction, if imbued with the spirit of justice. It is perplexing, however, for telegraph companies to treat with numerous sets of state commissions, all clamoring to "regulate" the telegraph according to their own peculiar and too often fantastic notions.

Mr. Carnegie, in a recent letter, takes strong ground that the control of common carriers engaged in interstate commerce should be lodged exclusively in the Interstate Commerce Commission. He says: "I cannot too strongly advise against there being more than one authority to pass upon such questions, and that should be the Interstate Commerce Commission. If common carriers be placed under one commission and industrial interstate commerce under the Bureau of Corporations, or another commission, there must arise invidious comparison between the two. Such comparisons will be publicly made. The party denied by the one will be disposed to feel that the other takes more liberal views, and vice versa, and vent his disappointment. Imagine two Supreme Courts! The standing of both courts would be lowered. No reason why the Interstate

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Commerce Commission should not deal with the whole subject and every reason why it should. Its members will get a wider view of the whole question in its different phases. It is really one question, not two."

Following out the prompting expressed by the coming into being of the Interstate Commerce Commission, it may be that eventually as a logical sequence—as a measure of equity and protective justice to interstate common carriers, that charters for all such will be conferred by the general government, because of the exercise of a broad continental control, rather than by the decree of an individual state.

Andrew Carnegie's Honor-Pension for Needy Survivors of the United States Military Telegraph Corps.

The January 16 number of Telegraph Age contained the correspondence between Mr. Carnegie and the executive committee of the United States Military Telegraph Corps, under the provisions of which an honor-pension of $144 annually is secured to such of the surviving members of that historic body of men as are now in needy circumstances.

We are informed by Mr. David Homer Bates, of this city, secretary of the executive committee, that up to date the Carnegie relief has been granted to twenty-nine of his comrades, representing about fifteen per cent. of the known survivors. One of the recipients died within a few weeks after receiving his check. Several others are reported to be very old and feeble, so that it is quite unlikely they will be present to answer the roll-call next year when, if living, they would be entitled to receive a second payment.

We wonder if Mr. Carnegie, the "Founder of the Corps," as he was denominated on the famous dinner card at the reunion on March 28, 1907, at the Hotel Manhattan, New York City, has even a faint idea of the great amount of good accomplished by his gracious bounty, not only to the immediate recipients by the relief in their time of pressing need, but also to each member of the corps of his founding by his close identification with that corps in this manner, and the strengthening of the bond of fellowship between its members and their first official head.

Some of the letters of acknowledgement of Mr. Carnegie's pension checks are pathetic; all are profoundly grateful. Their names are recorded in the confidential files of the executive committee and for obvious reasons will not be made public.

Telegraph Age on behalf of all the survivors of the corps, takes this occasion to extend heartfelt thanks to Mr. Carnegie, the "Founder of the Corps."

Mr. Buxton, in reply to Mr. Watt in the English House of Commons recently, said that he "estimated that the annual 'loss' involved by the system of cheap rates for newspaper telegrams was about £220,000, in return for which the nation enjoyed such advantages as were derived from the dissemination of news at a cheap rate, and he did not propose to charge this class of traffic at the same rate as ordinary telegrams. There would appear to be no 'loss' on this account, but on the contrary a net gain of such an amount as had been netted on this class of traffic, for it is a matter for argument that it would not exist to the full or in part if charged at the higher rate. The 'loss,' therefore, may be considered a 'theoretical,' not an 'actual,' loss as the reply would appear to indicate, as every telegraph system, it may be said in reason, looks upon 'press' as additional revenue. It is transmitted more easily and generally at times when lines are clear or not pressed by ordinary traffic."

And now Rhode Island, small in area but mighty in majesty when seeking to assert its power, would put pressure upon the unfortunate telegraph companies, and by legislative enactment compel them to keep all offices located in towns of 5,000 population, or over, open at all times. As compliance with such a strict measure would not be warranted by the amount of business handled, and as the eight-hour law in that state, as laid down under the proposition, would require three separate operators to maintain the office during the day of twenty-four hours, failure in which, as in certain other observances, would be followed up by the imposition of sundry fines, it is altogether probable that telegraph facilities in Little Rhody, if the impossible be insisted upon, may be narrowed down very materially, so far as the number of offices is concerned.

The annual report of the wire department of the City of Boston, just at hand, affords an excellent insight of what has been accomplished by the operations of that department in the New England metropolis during the year 1907. A series of well-executed illustrations in duplicate show views of street wire conditions both before and after the removal of aerial wires. Boston is evidently making fine progress in improving the appearance of its streets by removing overhead wires to underground conduits. The report, which is embodied in a pamphlet of forty pages, and which is supplemented by a sectional map showing the prescribed district for 1908, has been compiled by James E. Cole, acting commissioner of wires.

In an appeal taken by the Postal Telegraph-Cable Company at Norristown, Pa., recently, on what was termed an exorbitant charge made by the borough of West Conshohocken for the inspection of telegraph poles, the judge handed down an opinion fixing the rate at ten cents a pole. The borough had taxed each pole $1.

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Patent Laws Need Reform.

Urgent representation being made to Congress in behalf of the Harrison bill for the establishment of a central patent court of appeals for the United States brings into prominence, says a contemporary, a big vexed and important issue that has not been given the attention it deserves in legislative deliberation because, probably, of its vexatious nature, and which has not been impressed upon the public mind as being vital because, probably again, of general ignorance, misconception or lack of information regarding its importance.

Everybody knows we have patent laws. Everybody knows, in a vague way, that when an inventor discovers a new idea or mechanism or process, he applies to the government for a patent, and that this patent is supposed to give him a right of monopoly in the profits from its use for a limited term. Behind the idea of granting patent rights and monopolies is a fundamental idea or theory that such a system benefits the public. This theory is that the patent, by giving the inventor a monopoly and not permitting others to use his method, idea or process without paying him for such use, encourages invention, and that the encouragement of invention benefits the public by increasing and multiplying inventions that conduce to the great comfort, happiness and prosperity of the people.

In theory the system is defensible, if not unassailable. In practise, under the patent laws of the United States, the theory is not working well. Ask any honest, experienced patent attorney, and he will tell you very frankly that because of defects in the system our patent laws to-day are so easily evaded or abused that they very often afford little protection to the inventor and frequently do not serve the purpose of benefiting the public.

It occurs so often as to have become almost an axiom that it is not the inventor but some capitalist or promoter who benefits from the patent monoply. It also occurs, possibly even more frequently, that the granting of patents by the government does not result in giving to the public the benefit of the new invention, but in actually depriving the public of such benefits. The records of the patent office are full of stories of valuable and wonderful inventions for improving methods of manufacture, transportation or communication, which have been bought and pigeonholed by great trusts or business concerns to get them out of the way and prevent a competition that might seriously injure the older methods and the capital invested in machinery or plant which the new invention, if used, might make obsolete.

Other countries have tried to meet and solve both these problems by changing their patent laws. In some European countries, for instance, patents are required to be "worked" within five years. If the invention patented is not put to use in that time, the patent monopoly is nullified and anybody may make free use of the new idea. This is intended to protect the public from improper monopoly and disuse of the patent rights. In other countries, too, efforts have been made to protect the inventor without infringing on public interests.

Germany's patent laws differ from those in this country in a vital respect. Understand that before a patent is granted the claims made by the inventor are supposed to have been thoroughly examined by a government expert who goes through all the records, decides whether the idea presented is one deserving of a patent, and determines whether or not it is a really new suggestion, or is simply a repetition in slightly different or identical form, of some idea already patented. This is done in all countries. In Germany, after having thus examined the idea and granted the patent, the government practically assumes the responsibility for the patent. That is, having declared the invention is a proper one to be patented, the government stands behind this opinion and defends the inventor or patentee from infringement. It helps him in case his patent is attacked; it punishes those who infringe his patent, and after a short period of years it makes patent incontestable.

In the United States the government, after granting the patent, leaves the inventor or patentee to fight the thing out for himself. He must fight infringements in the courts without aid from the government. At any time during the life of the patent it is open to attack from anybody who chooses to attack it, and the patentee must defend himself from these attacks without government aid.

Much of the difficulties experienced in efforts to protect inventors and the public under our patent laws lies in the method of court procedure. Other countries have patent courts, with men on the bench thoroughly versed in the patent law, and familiar with patents. In the United States, patent cases are tried before judges in the Federal, District and Circuit courts. These judges are supposed to know patent law and procedure offhand. A patent case involving an important question of ownership or rights in which the decision depends upon some very delicate question of chemical process or some complicated mechanical action or elusive electrical theory, must be tried before a judge who possibly knows nothing of machinery, electricity or chemistry, and the case may be sandwiched in between one concerning railroad rates and another dealing with admirality law.

It is no exaggeration of present conditions in patent law practice to say that until a patentee has had his right confirmed by the United States Supreme Court or by every Federal Court of Appeals he has no security whatever against continued litigation on any contested ground. If his right is violated in California, for instance, he must sue for infringement there; if he wins in the District Court he must face an appeal. Unless he can secure a general affirmation of his right by the United States Supreme Court, he

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may have to sue in each of the nine judicial circuits of the country to defend his rights. He may win in one district and lose another suit, brought on the same grounds, in another district and before another judge. Probably the nearest approach to a central court of patents in the country is the Court of Appeals of the District of Columbia, where about half the docket is made up of patent cases. Because of this large amount of patent business in this court, patent attorneys say, its rulings are usually such as tend to bring the proceeding in the judicial circuits into unfavorable comparison.

A House committee is now conducting hearings on the Harrison bill. There seem to be only two sources of opposition to the central court plan; patent lawyers practicing elsewhere than in Washington, and general practitioners who fear such a court would put a high premium on patent law specialists. The main reason for the failure of Congress to have established such a court before this, and the main cause for present delay and difficulty, seems to be that the lawyers can't agree concerning the details of a bill.

The Electrical Properties of the Atmosphere.

In the study of the electrical properties of the air considerable advance has been made during recent years, but we are still sadly ignorant of the behavior of this element. The subject is interesting not only from the scientific point of view, remarks the Electrical Review, but to engineers, who are looking forward to a decided increase in the voltage of transmission systems, whereby they hope to decrease the cost of construction and at the same time increase the area over which power may be economically distributed.

For a great deal of our knowledge regarding this ever-present mixture of gases we are indebted to Dr. J. J. Thomson, and we have come to expect from time to time further additions by him to this. In a recent lecture before the Royal Institution, of London, he discussed the conduction of electricity through gases, but limited his remarks to one method by which this is brought about; the method, he said, which is so inconspicuous under ordinary conditions that for many years it was not recognized at all. This is the conduction brought about by ionization of the air, itself caused, it is believed, by radioactive substances.

The seemingly erratic behavior of air when employed as a conductor of electricity has been one of the most puzzling electrical phenomena, but this, it is now believed, is fully explained by the recognition of the presence of radium emanation in the air, which brings about a degree of ionization depending upon the quantity of the emanation present, and, hence causes the air to act as a conductor in the same proportion.

Another interesting question is to explain how the earth manages to maintain its negative charge if it is surrounded by a conducting atmosphere. The potential gradient in the air is fairly large and may indeed be as much as one volt per centimeter, which would indicate that the negative charge should be neutralized rapidly by the positive electricity of the air. The fact that this neutralization is going on continuously has been established by C. T. R. Wilson, who found that the rate of neutralization is sufficient to discharge the earth in an hour if the negative charge were not being continuously given back to the earth. How this is done has not yet been explained, but Dr. Thomson thinks that rain plays a large part in it, if it is not, in fact, the sole agent. Drops of water form more easily on negatively charged particles. Rain may be thought of, then, as forming on the negatively charged dust particles, and as it falls to the earth it not only clears the air, but restores to the earth its negative charge.

One of the most surprising features of modern scientific advance is the new light it is shedding on forces and actions which are continuously playing around us, but of which we have had no intimation before. One can but wonder what influences they must exert on every phase of terrestrial life and development.

Advance in Wood Preservation.

"Timber thoroughly treated with proper preservatives will last almost indefinitely," says a government expert who is an authority on wood preservation. "Engineers have known for years that this is true," he continues, "but up to the present time, at least in America, complicated and expensive plants have been necessary for the work and wood preservation has often been too expensive an operation to allow treated timber to come into general use."

Methods in wood preservation have undergone a marked change in the last few years, however, and the work which a few years ago was limited to a few experiments carried on in scattered parts of the United States has grown with such rapidity that wood preservation has become a business which figures most prominently in the industrial life of this country.

Each year users of timber are treating an increasing portion of their supply by bringing preservatives into play to close the pores and prepare the timber they use to resist the fungi which cause decay. The work points the way to one of the chief means of the conservatism of the nation's forest resources, for as the length of the life of timber is increased the drain upon the forests is lessened, and more wood made available for use.

Andrew Carnegie in a recent address said:

"The curse of drink is the cause of more failures in life than anything else. You can surmount every other faulty habit, but the man who is a confirmed drinker has not one chance in a million of success in life. Liquor will conquer you, a million chances to one, if once you give it sway."

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Historical Sketch of the Late Hon. William Orton, President of the Western Union Telegraph Company.

BY A. W. ORTON, OF ROME, N. Y.*

The several men who in the past have attained to the presidency of the Western Union Telegraph Company have been men of large executive calibre and of pronounced individualism. Their names are indissoluably woven in the history of the great corporation over which in their day and generation they were called upon to preside. It is instructive and interesting to read the narrative which presents a view of their lives.

The following embodies some personal facts related to the writer by Mr. Orton when he was president of the United States Telegraph Company, in 1865 and 1866, with the company's headquarters in New York City. It was mainly through the personal efforts of Mr. Orton that the United States with other telegraph companies were merged into the Western Union system.

William Orton descended from Thomas Orton, who came to America from England in the year 1636 and settled in Windsor, Conn. William was the oldest son of Horatio W., and was born on a farm about two miles southeast of Cuba, Alleghany County, New York. In his earliest years he made the most of the opportunities of the district schools which he attended, and long before he grew to manhood's estate he engaged in the work of teaching in these schools. He soon found he could increase his efficiency as a teacher by laying a better educational foundation for himself. With that end in view he attended a school in one of the Eastern states, where he met a teacher from whom he gained more knowledge than from all others; he learned from him the secret of how to teach himself. Young Orton entered the State Normal School at Albany, N. Y., under the inspiration of David C. Page, one of the pioneers in the work of normal training, graduating from that institution in 1847, expecting at that time to devote his life to the profession of a teacher. Had he done so he would undoubtedly have been as brilliantly successful in this calling as he afterwards became in other lines of endeavor. He did not, however, teach many years after his graduation. His fine presence and his marked executive ability attracted to the young schoolmaster the attention of business men, and he was soon induced to exchange the vocation of the pedagogue for a position in the publishing house of George Derby and Company, of Geneva, N. Y. Here he advanced rapidly in the esteem of the firm and was early admitted to a partnership in the business. The concern was transferred eventually to New York. The Civil War coming on, the firm met with reverses. For a short time thereafter Mr. Orton was associated with the firm of J. B. Gregory and Company, publishers. Mr. Orton told the writer that the year before his firm met with reverses, just prior to the Civil War period, the profits for the year were fully twenty-five thousand dollars, while the next year, so disturbed were the times, that the house became hopelessly involved.

After the merger of the telegraph companies, before referred to, had been accomplished, Mr. Orton was presented with several thousand dollars, voted him by the companies for the successful completion of the combination he had been the means of effecting. With this money he discharged the old debts left by the publishing firm, although he was not legally obliged to pay the obligation; with his sense of right of justice and honor he could not feel this money was his to retain.

Soon after reaching New York he began to take an interest in public affairs, and especially in the then newly-formed Republican party, to which he was a staunch adherent all his life. A man of intelligence and force of character, he rose rapidly in public favor and in 1862 was appointed by President Lincoln collector of internal revenue for the most important district in the country, namely, the sixth district of New York, which embraced Wall Street. He showed such efficiency and mastery of the business that his district became the standard of the country, not only in point of magnitude in amount of business handled, but in efficiency of management. At this time a congressional committee desiring information as to the working of the law in internal revenue matters sought enlightenment from the commissioner of internal revenue at Washington and found that he was not able to answer them as to all points; they were advised to send for the collector of the sixth district of New York. The committee summoned William Orton and he showed such thorough knowledge of every point involved that it at once occurred to the members that he was the right man to be at the head of the department in Washington. In the course of a year a vacancy in the commissionership came and Mr. Orton was appointed by President Lincoln to the place in 1865. His administration was efficient and successful in every way.

In Washington Mr. Orton made the acquaintance of the leading men in the country, and the pathway of political preferment seemed open to him, but he was not long permitted to remain in political life. He was prevailed upon to accept the presidency of the United States Telegraph Company. In a short time the consolidation of this organization with its great rival, the Western Union, was brought about, and Mr. Orton was made vice-president of the absorbant company. In 1867 he was elected its president, and to this gigantic corporation and the multitudinous duties it involved he devoted the remainder of his life, withholding no service he could possibly render. The burden of the management of the Western Union Telegraph Company had rested about from the foundation of that corporation on his shoulders. He was neither a practical telegrapher nor a heavy capitalist; he was chosen rather for his efficient executive ability. He was a constant worker; he would devote the usual hours of business to the discussion of details of his office, the night would find him poring over his correspondence, studying up the law cases in which the company was always involved, engaged in consultation to repel assaults

* The author of this sketch is an old-time telegrapher, a member of the United States Military Telegraph Corps, and is a distant connection of the family of William Orton.

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in legislature or Congress upon the property committed to his management, or starting on a moment's notice journeying across the continent, to the capital of a distant state, or to adjust a complicated controversity at Havana; he was never free from the pressure of his position.

Wherever the wires reached men were always talking to him about business. He was a good talker, whether engaged in debate or speaking from the platform. He was a rapid and clear thinker, and his speech flowed easily, with a racy flavor of sarcasm or humor, as fact or fancy directed him; his observation covered a wide range of vision, with a broad knowledge on all public questions. He was a politician by instinct, strong in his Republican convictions and warm in his friendships.

It was to his credit, being early consulted by personal friends who were pressing General Grant for a third term for President, that he refused to be a party to that movement, taking such a stand in the counsels of his party that did much to render that nomination impossible. After the death of Horace Greely, in the winter of 1873, Mr. Orton purchased a controlling interest in the New York Tribune and actually engaged Schuyler Colfax to become the editor-in-chief of that journal. The latter soon withdraw from the engagement and while in doubt about an editor Mr. Orton received an offer to take the paper off his hands at a price that afforded him some profit, an offer that he accepted, disappointing some of his friends thereby, and which he himself subsequently regretted.

The disease that brought death to William Orton was called apoplexy. It was a misnomer; he was killed by overwork; his life was brought to a premature end by the burden and strain of the office to which he gave conscientious attention, undermining his health. He died in New York City, April 22, 1878, when nearly fifty-two years of age.

William Orton would have been a striking and leading personality in any community in any line of work. In matters of executive ability he rose to the rank of genius.

After the death of Mr. Orton there was some talk of William H. Vanderbilt for the president of the Western Union Telegraph Company, but he did not want the place with his other duties. The senior vice-president, Dr. Norvin Green, was subsequently elected.

Telegraph Messages Wilfully Delayed in India.

A recent despatch from Bombay, India, says:

"Discontent on the part of the telegraph signalers with the new scheme of duties introduced by Mr. Newlands, the English expert, has produced the most serious congestion on the Indian lines. The director-general states that the operators are purposely and wilfully delaying messages. All deferred-rate telegrams are posted instead of being telegraphed, and 2,000 telegrams are held up at Rangoon. Cables forwarded from Europe via Teheran are seriously delayed from Karachi onwards."

The London Times, in discussing the telegraph situation in India, has the following:

"The news of serious congestion on the Indian telegraph lines consequent, it is alleged, on the discontent of the signalers with recent changes in the departmental regulations will not surprise those who have been following the course of events in the telegraph department during the last few months. With a view to improve the working of the department, the government of India requested the authorities of St. Martin's le Grand to lend the services of an expert to investigate the whole system in force. Mr. J. Newlands was selected for the duty, and went out to India at the close of last summer. Lecturing at Rangoon at the beginning of the year, Mr. Newlands said that the system in vogue was altogether defective, and that the public had a right to expect better service. The department was badly in need of reform in all its branches, and unless taken in hand would never be able to cope with the growing volume of work. His criticisms, which do not seem to have been qualified by any recognition of the differences between English and Indian conditions of climate and work, excited some alarm among the operators, and from that time on there have been signs of uneasiness and dissatisfaction. Various changes in the regulations affecting the signalers were made, and others were understood to be in contemplation. It was unofficially stated at the end of February that a new scheme of duties had been worked out by Mr. Newlands for immediate introduction in the mofussil stations, and to be applied later to the 'Presidency' towns. The basis of the 'watch' seems to have been that of eight hours' continuous duty, in the night as well as in the day division. Meetings of signalers were held at Calcutta, Agra, and other large centers, and resolutions were passed praying the director-general to reconsider the new system of watches, as unsuited to the climate and conditions of India. Meanwhile, further trouble arose from a strike of the messengers in Calcutta, which was, however, settled by the grant of certain small concessions. On March 3 a deputation of some two hundred and fifty members of the signaling staff in Calcutta, headed by Mr. Lafont, the telegraph master, waited on the director-general, who said that they were unnecessarily excited, as the new scheme of duties had not yet been brought into definite operation. At a second interview certain modifications in the scheme were promised. Mr. Harvey, the officiating member of the Council for Commerce and Industry, was also seen by a deputation, which asked for a twenty-five per cent. increase of pay all round.

"Serious congestion of traffic was already being experienced a month ago, and representations were made to government on the subject by several of the chambers of commerce and trades' associations. In particular the Bengal Chamber of Commerce drew attention to the danger of a general strike of signalers, and to the serious loss this would entail on the commercial community. There could be no doubt, it said, that the discontent was more or less general, and the time would seem to have come when a searching inquiry into the whole matter should be made by government. It might reasonably be anticipated that if such an inquiry was promised the danger of a strike would be averted."

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Government by Wire.

(From the London Daily Express of April 5.)

A situation that is entirely without precedent in the history of the British constitution exists to-day. There is no head of the government in the country. The King and the Prince of Wales are on the Continent. The Prime Minister has resigned office, and Mr. Asquith has not yet started for Biarritz to receive his appointment as Premier at the hands of the King.

If such a state of affairs had existed a hundred years ago, and Napoleon had seized the occasion to display his faculty for throwing all Europe into convulsions at a moment's notice, something like chaos would have been the result in this country. To-day, by the aid of the telegraph, it is as easy for King Edward in Biarritz to keep in touch with public events in Great Britain and to take his part in the government of the country as it was for one of the Georges when he had only gone as far away from Buckingham Palace as Windsor Castle.

Government by telegraph is one of the most striking developments of the last half-century. Rulers and their ministers can go where they choose and yet keep in the closest touch with the affairs of their nations.

When the Kaiser was rusticating in Hampshire last year he had a private telegraph office fitted up at Highcliffe Castle, and during the whole of his stay in England he transacted his business with the same regularity and as expeditiously as if he were in the imperial palace at Potsdam.

Modern science has made life very pleasant for twentieth-century monarchs compared with their feudal predecessors. The mediaeval monarch with a weakness for sightseeing who had the temerity to leave his country for a brief excursion probably came back to find that there had been a revolution in his absence without his knowing, and that instead of being a king he was merely a private person in imminent danger of having his head chopped off.

Even Asiatic monarchs who rule peoples in which the primitive instincts are still the strongest come and go with the regularity of the confirmed Cook's tourist. The King of Siam wanders round the watering-places of Europe; the late Shah had a passion for traveling; even the Ameer of Afghanistan made the excursion of his life last year, and traveled all through India.

In Europe King Leopold spends half his time in Paris, King Alfonso makes long stays in England, and King Edward spends three or four months a year abroad. But they never lose touch with their capitals, and if one of them were to cross the Atlantic he could receive despatches at sea by wireless telegraphy rapidly and precisely.

The two heads of great powers who are forbidden by their constitutions to leave their native soil are the Mikado and the President of the United States. The Mikado in this respect is the most circumscribed modern ruler, for though Mr. Roosevelt may never leave United States territory he has half a continent to roam over. When he goes on his shooting expeditions in Wyoming he is as far from his capital as King Edward would be in New York, but the President manages to transact his state business in the gorges of the Rockies nearly as easily as if he were in Washington.

Fast trains and fast steamers by which they can return rapidly have contributed almost as much to the comfort of travel-loving kings as the telegraph and the telephone. Supposing, however, by a wild stretch of the imagination, that communication by wire with the Continent was cut off, and that a foreign fleet began to land an army to-day on the Essex marshes, or that some one organized a revolution and sacked Buckingham Palace, and that there was no means of informing the King. Who would be the executive head of the realm?

The responsibility would devolve on the person of Lord Loreburn, the Lord Chancellor. The popular lawyer, whom everybody knows as "Bob" Reid, would be the central figure of a great drama, and the responsibility for the security of the nation would devolve on him.

The Lord Chancellor is the keeper of the great seal of England, which he hands to the King to be affixed to all important state documents. James II. thought the tenure of the great seal so important that when he was fleeing from Ireland to France he threw it overboard, hoping thereby to stultify all the behests of William III. But another was made, and William was secure on his throne.

All sorts of fascinating questions are raised by the absence of the King and the assumption of semi-royal functions by the Lord Chancellor. Would Lord Loreburn, for instance, be commander-in-chief of all the forces of the Crown—naval and military? Would he also be the head of the Church?

These possibilities are in the last degree unlikely, but it is curious that so much faith is placed in the reliability of the telegraph that the constitution makes no provision for such a situation.

The absence of the King used to be met by the appointment of a person known as a Justiciar when His Majesty went abroad. This fell into desuetude in the reign of Henry III. After that there were appointed custodes regni or locum tenentes. Thus, when Henry III. went to Gascony, the Queen and the Earl of Cornwall were made guardians of the realm.

A Council of Regency took control of state affairs when Edward I. went abroad, and when William III. went to Holland Queen Mary was given power by statute to exercise the royal prerogative. Regents or Lord Justices exercised this function during the absences of the Georges. The Prince of Wales was made Guardian and Lieutenant of the Kingdom in 1716, and in 1732 Queen Caroline occupied the same position.

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The last occasion when Lords Justices exercised the royal prerogative was in 1821 during the absence of George IV. Since then no provision has been made for the absence of the monarch—a remarkable testimony to the faith placed by the government in the reliability of the telegraph wires.

The World's Telegraphs.

The Bureau International des Administrations Telegraphiques has issued its report for the thirty-ninth year, viz., 1907. In accordance with the resolution adopted by the Berlin Wireless Telegraph Conference of 1906, the Bureau organized a department to deal with this branch of the service, and it was fully working on January 1, 1907. The following countries are now adherents of the St. Petersburg convention, viz., Germany, Argentina, Australian Commonwealth, Austria, Belgium, Bolivia, Bosnia-Herzegovina, Brazil, Bulgaria, Cape of Good Hope, Ceylon, Portuguese Colonies, Crete, Denmark, Egypt, Spain, France and Algeria, Great Britain, Greece, Hungary, British Indies, Dutch Indies, French Indo-China, Iceland, Italy, Japan, Luxemburg, Madagascar, Montenegro, Natal, Norway, New Caledonia, New Zealand, Orange River Colony, Holland, Persia, Portugal, Roumania, Russia, Senegal, Servia, Siam, Sweden, Switzerland, Transvaal, Tunis, and Uruguay. The total area of all these countries is 65,895,439 square kilometers, with a population of 945,413,154.

Of the various telegraph companies, nineteen are adherents, fifteen conform to regulations although non-adherents, and five correspond with the bureau through the medium of other companies. In the first group are included the Black Sea, Commercial, German Atlantic, East European, French, German-Dutch, Rio de la Plata, Direct Spanish, Direct West India, Eastern, Eastern Extension, Great Northern, Halifax and Bermudas, Indo-European, South American, Spanish National, West African, West India and Panama, and Western Telegraph and Cable companies. The second group comprises the African Direct, Amazon, Western Union, Anglo, Central and South American, Commercial Pacific, Cuba Submarine, Direct United States, Eastern and South African, Europe and Azores, India Rubber, Gutta-Percha and Telegraph Works, Mexican, Pacific and European, River Plate and West Coast of America Telegraph and Cable companies. The third group consists of the African Trans-Continental, British North Borneo, Commercial (Cuba), Postal and United States and Hayti Telegraph and Cable companies. After enumerating the various cables laid and telegraph lines constructed, the report states that during the past year 5,200 new offices were opened to international traffic.

The bureau had estimated their receipts for 1907 at £6,501 and expenses at £2,580, whereas they amounted to £5,663 and £2,511, respectively, leaving a sum of £769 in favor of the administration. The estimated receipts and expenditures for 1908 are also given, which, in view of the telegraph conference to be held at Lisbon, Portugal, on May 4, are higher than in 1907.

Insuring Telegraph Messages.

Denmark proposes to establish a method whereby telegraph messages can be insured by the sender, as has been previously mentioned in this journal. In other words, for a certain additional cost the company guarantees safe and accurate delivery, or, where such is not brought about, makes good.

It is due to a telegraph operator, M. Gredsted of Copenhagen, that the Danish government is now earnestly considering the advisability of taking up the insurance question.

For certain reasons the state department did not consider it advisable for it to take the matter in charge, but the greatest consideration was shown the project, especially to the extent that the department of telegraphs was authorized to accept the premiums due for the insured messages. Probably the best method, and one which is meeting with general approval, is the plan to issue stamps, which, when attached to a message blank, will inform the operator the telegram is insured against delay or wrong interpretation, whether from the sending or receiving station. It may be taken for granted that the operators under such conditions will be on their guard.

No other country in the world has so far considered it advisable to insure telegraph messages, and it will be the office of the Danish Transportation Insurance Company, the "Danish Lloyd," to be the pioneer in this direction, since the department of telegraphs is now negotiating with this company for that purpose. At the start it is considered likely that the premiums will be high, at least until such a time when the idea has had time to demonstrate its efficiency. In some instances, where commercial houses or industrial concerns doing much business over the wire desire to cover their entire telegraphic correspondence against loss through delay or mistakes, this can be done. So far the greatest amount for which any one telegram will be insured is to be 5,000 krone ($1,350), but it is not unlikely that greater figures will obtain later on.

The Herald's Chinese Cable.

The New York Herald of April 10 contained almost three pages of very interesting matter relating to the Chinese boycott of Japan's commerce.

The features of the display were the reproduction of a code telegram representing 1,800 characters of the Chinese language and the reproduction of this in Chinese type.

The process by which the code was made out and printed was given to the readers and proved very interesting. When the cipher was received it was sent to a Chinaman to be translated, which he did in Chinese characters.

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The Military Telegrapher in the Civil War.

PART TWO.

Continuing the publication of letters begun in the April 1 issue of TELEGRAPH AGE, written by military telegraphers who were active in the field performing highly important and patriotic duty in connection with the army during the Civil War, the following by Duncan T. Bacon, dated at Logansport, Ind., June 30, 1879, is an interesting contribution to the series. It was addressed to Col. William R. Plum, for insertion in his history of The Military Telegraph during the Civil War, a plan, as previously stated, that was abandoned by reason of the great amount of matter received.

Here is the letter:

"As near as I can recollect I was sworn into the Government service at the St. Louis (Mo.) Arsenal in the latter part of July, 1861, by Major Gordon Granger, being, I believe, the fourth operator employed by the United States in the then 'Department of the West.' I was at once assigned to duty at the headquarters of General John C. Fremont in St. Louis, that office being in charge of J. C. Sullivan, familiarly known as 'Yankee Sullivan.' I remained at that office until General Fremont was superseded by General Hunter, when I was transferred to Benton barracks, then under the command of Major General S. R. Curtis. In January, 1862, I was sent out on the North Missouri road with General J. M. Schofield, and was stationed for a short time at Hudson, Mo. In the latter part of the month I was recalled from the northern part of the State and ordered to Rolla, Mo., there to report to General Curtis for field service. This I did, and was placed in charge of the construction and operation of the military telegraph line from Rolla as far as the army under General Curtis should move.

"While on this duty I built and opened a line of telegraph from Rolla, via Lebanon and Springfield, to Bentonville, Ark., a distance of some two hundred and fifty miles, and was present as operator and cipher clerk during the Battle of Pea Ridge, in March, 1862. While waiting at Springfield, Mo., for a supply of wire insulators and other building material I, as well as the men and operators under my command, were made very comfortable through the kindness of Captain Philip H. Sheridan, the post quartermaster, who placed one of the finest houses in the town at our disposal, and who also took care that our rations were of the best. Shortly after our supplies arrived, Captain Sheridan was ordered to St. Louis and assigned to the staff of General H. W. Halleck as staff quartermaster. After the Battle of Pea Ridge the army fell back to near Cassville, Mo., and I was ordered to St. Louis to take charge of the telegraph in the operations that were about to be commenced south of Cairo. I turned over the command of the telegraph department to Luke O'Reilly, an operator who had been with me all the way through from Rolla, and who not long afterwards became a great favorite with General Curtis, and was by him placed upon his staff with rank of second lieutenant and aide de camp. When I last heard of O'Reilly he was captain and aide de camp on the staff of Major General A. H. Terry.

"Leaving the headquarters of General Curtis I, in company with one of my men, started for St. Louis, and after five days of hard horseback riding, averaging fifty miles per day, reached Rolla and there took the train for St. Louis. Immediately upon my arrival at the latter city I was ordered by Major G. H. Smith, superintendent of telegraph in the Department of the West, to report at once to Major General Halleck upon the steamer Continental, for service in Tennessee and Alabama, and almost before I knew where I was going I was on board of that vessel and bound down the river for Pittsburg Landing, Tenn. General Halleck and a large number of officers were also on board, together with a well organized corps of telegraph men, which had been placed under my charge.

"We arrived at Pittsburg, Tenn., on the evening of the second day of the battle of Shiloh, and found everything in the utmost confusion. One of the first things I did was to lay a telegraph cable, which we had brought with us, across the Tennessee River. This being successfully accomplished, we were soon in connection with Nashville and Louisville. I will here insert a copy of an order, the original of which I now have in my possession:

"'Pittsburg, Tenn., April 18, 1862.

"'Mr. Duncan T. Bacon is hereby authorized to take command of the construction party and the working and military lines at Pittsburg, Tenn., and as they may be built hereafter, until further orders. All operators will report to him for orders. Mr. Bacon will report daily to headquarters telegraph office or to Captain McLean, assistant adjutant general, for orders, and carry out such as he may receive with the utmost promptness.

"'(Signed) GEORGE H. SMITH,

"'Supt. Military Telegraph,

"'Department of the Mississippi.'

"In accordance with these instructions I at once opened an office at the headquarters of General Halleck, on the bluff overlooking the Tennessee River, and also opened a field office at the headquarters of the various division commanders, opening, I think, eight offices at as many different headquarters. The only names of operators in charge of these offices that I can now recall are L. C. Weir (Mr. Weir is now president of Adams Express Company, New York.—Ed.), at General Halleck's, and A. S. Hawkins at General Pope's. Mr. Hawkins, who was an old and intimate friend of mine, had, I believe, always been identified with telegraphy since that time, and up to the date of his death, which occurred at Memphis in the fall of 1878, from yellow fever, he having heroically volunteered to go to the assistance of his brethren in that plague stricken city, and fell at his post in the discharge of a more than soldier's duty.

"During the attack upon and the subsequent siege of Corinth, I remained in charge of the telegraph operations in the field before that place, and

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upon the day after its fall, in June, 1862, I was ordered to Memphis.

[At this point two pages of the letter are missing. —Ed.]

"Some of the Confederate operators we found there were afterwards caught tapping the wires and furnishing information to the enemy, giving us no little trouble and annoyance. Notably among these were 'Ed.' and 'Alf.' Saville, both original secessionists, and willing at all times to fight for their side. The telegraph lines now having been put in working order, Memphis was once again placed in communication with the north. General Halleck still remained at Corinth, Miss., and General U. S. Grant was sent to Memphis to organize an expedition for operations at Vicksburg. Business getting quite heavy over the lines, I found I needed more assistance, and soon found a soldier who had had some previous experience in the telegraph business, so, upon my application, the following order was issued:

"'Headquarters Dist. of West Tenn.,
"'Memphis, June 26, 1862.

"'Special Orders,
"'No. 120.

"'Private Philip Isaacs, Company C, 11th Indiana Regiment, is hereby detailed for special service and will immediately report to D. T. Bacon, United States Telegraph office, Memphis, for duty. By order of Maj. Genl. U. S. Grant.

"'(Signed) JOHN A. RAWLINS,
"'Asst. Adj. Genl.'

"About this time the White River expedition, under command of Col. G. N. Fitch, of the 46th Indiana Volunteers, was started with the intention of forming a junction with General Curtis, who was coming down through Arkansas. These two officers were in the habit of reporting their progress direct to General Halleck at Corinth, through special couriers to Memphis, thence by cipher telegram to the commander in chief. These despatches were usually taken direct to me and by me put into cipher and forwarded. General A. P. Hovey, in command of the post at Memphis, claimed that he should be furnished with copies of all such dispatches. Declining to furnish them, I was preemptorily ordered under arrest by the General. The following from Albert D. Richardson, Esq., Memphis correspondent of the New York Tribune, under date of July 18, 1862, to his paper, explains the affair:

"'On Wednesday, General A. P. Hovey, commanding this post, ordered D. T. Bacon, Esq., manager of the military telegraph, to furnish him copies of official dispatches from General Halleck to General Curtis and Colonel Fitch. General Hovey's motives were doubtless good—to keep himself advised of everything important affecting his post directly or indirectly. But Mr. Bacon knew his duties too well to commit the gross breach of official duty required of him. He respectfully declined to obey the order. General Hovey directed his arrest, but Mr. Bacon was absent from the office when the orderly arrived, and one of his associates, Mr. F. S. Van Valkenburg, was arrested instead. The case was laid before General Halleck by Mr. Bacon, when "Old Brains," as the General was familiarly known, promptly replied: "Release the operator at once. He did perfectly right in disobeying your orders."'

"Shortly after this affair the troops in the vicinity of Grand Junction and Corinth, under command of General W. T. Sherman, were brought to Memphis, and the movements against Vicksburg were begun. General Halleck left Corinth and returned to St. Louis. The telegraph lines between Corinth and Memphis, being thus wholly unguarded, fell into the hands of the Confederates, who tore them down and carried off the wire, appropriating it to their own use further south. Memphis being again cut off from telegraph communication with the North, I was ordered, about the middle of August, to close the office and report with all instruments, supplies and employes, at headquarters at St. Louis, which I did as soon as possible. Capt. T. B. A. David, having superseded Major G. H. Smith as superintendent of United States military telegraphs, I was assigned to duty at headquarters office, St. Louis, Mo., where I remained until my resignation was accepted in April, 1863.

"I returned to my home at Ogdensburg, N. Y., taking a position there in a railroad freight office. At the time of the first draft for soldiers in July, 1863, I was lucky enough to draw a prize, and was one of the very first men drafted in the district, but my former service in the United States Military Telegraph Corps was considered of sufficient importance to exempt me from serving as a drafted man, and I was honorably discharged. I did not again enter the service, although I received tempting offers to do so from Capt. J. C. Van Duzer and other military telegraph superintendents, and I have since frequently regretted that I did not remain in the corps until the close of the war."

The Telegraph in Mexico.

The Mexican government is actively engaged in extending its telegraph lines in many sections of that country, establishing new offices and improving the service in every possible manner according to modern methods. Large quantities of telegraph material of the very best class are being purchased in the United States for carrying out these extensions. Telegraph business with this country has already reached large proportions, and is rapidly growing. The work in Mexico is being conducted under the direction of Don Camilo A. Gonzales, the director-general of the Federal telegraph lines of Mexico.

All telegraph lines in the Republic of Mexico belong to the Mexican government. The salary of telegraph operators ranges from sixty to one hundred dollars per month according to their intelligence, experience and the importance of the office where they work.

If you wish to know all about the instruments you work, invest $1.50 in a copy of Jones' diagrams.

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The Polyglot Stenocode.

By A. C. Baronio, of London.

Every telegraphic code, on whatever system framed, in proportion as it is the result of orderly thought and labor, will possess its own attractive features which will appeal to some particular user whose requirements are limited to the extent of the ground that has been covered by the work, but the great desideratum has always been an universal code suitable for all times and capable of use for putting into cipher everything that can be written in English or any other language.

The essential features which must distinguish such a code are three in number, two of which are demanded by the interests of the merchant or other user of telegraphy, and the third by those of the telegraph administrations whose business it is to carry the messages.

The two which concern the user are: (a) That it shall be economical, in that it enables the maximum of meaning to be conveyed by the minimum of words; (b) That it shall possess unlimited scope for expansion.

That which concerns the telegraph administrations is (c) That it shall admit of quick and accurate transmission along their lines by the use of the fewest possible number of electric impulses.

The author indicated the principles on which such a code could be constructed in one of his former publications (London, May, 1880), but, owing to the disabilities arising from the then existing regulations with respect to code words, and the limitations of the apparatus at that time in use on submarine cables, he did not proceed with the matter. It may seem strange that instrumental limitations in dealing with the relatively small amount of traffic carried by the submarine cable companies should have been a prominent factor in the postponement of the development of an universal system of coding; but it must be borne in mind that it is in precisely that class of work, carried at the high cost per word and strictly limited speeds of the cables, that coding becomes most valuable—nay, imperative—and consequently a code which these limitations deprived of much of its value was obviously in advance of its time.

These limitations have been practically removed in recent years by the great advance which has been made in the sensitiveness and precision of the apparatus now employed in cable signaling, and especially by the invention of the "drum relay" by S. G. Brown.

The action of the International Telegraph Conference, held in London in 1903, in authorizing the use in code telegrams of artificial ten-letter words removed all remaining obstructions, and has enabled the author to produce this "Polyglot Stenocode" system, which perfectly fills all the conditions which we have seen are essential to the long waited for universal code. That it fulfils the first and second of these conditions—economy to user and scope for expansion—is shown by the fact, which appears from inspection of the table of conjugations, that, within a space nine inches by six, more than 1,000,000,000,000 different phrases are brought under immediate observation. Incredible as this might appear to those acquainted with the difficulties and restrictions of ordinary codes, it yet pales into insignificance when the reducer table is examined and the fact grasped that when the message has been coded by the Polyglot Stenocode the number of letters required to express it can still further be reduced by one-third, producing code words as now defined.

This table further provides an absolute safeguard against that great danger to which all other codes are exposed—of becoming useless through an alteration in the regulations governing the number of letters permissible in code words (say a reduction to eight-letter combinations)—for by its use Polyglot Stenocode words are capable of ready adaptation to such new length for the purpose of transmission, while still retaining many of the advantages and checks of the system. The third condition—facility and accuracy of transmission—is also filled in an equally complete manner; but owing to the necessarily technical nature of the subject, and the fact that some advantageous alterations in the present practice of signaling are required, a little explanation of the system in this respect is perhaps desirable.

The method used is a simplification of that described in "A Short Explanation of the Principles and Practice of Stenotelegraphy," the author addressed last year to all the telegraph authorities, and may, in its completest and most economical form, be summarized as the employment of biliteral combinations of a consonant followed by a vowel so selected as to be transmissible in the Stenocode alphabet by electric currents of uniform strength but varying direction or duration, after the manner of the common Morse system.

While the use of the Stenocode alphabet is necessary to obtaining the greatest benefit from the "Polyglot Stenocode" by the telegraph administrations, yet when used in conjunction with the slight changes in the ordinary Morse alphabet which were suggested in connection with plan A of Stenotelegraphy, a very considerable gain in the number of electrical impulses required to transmit each word is obtained, and also a substantial increase in accuracy.

It will be remembered that a feature of stenotelegraphy on that plan was that, by an exchange of characters between three of the letters, the alphabet is made to consist of two vowels of one element each, four vowels of two elements each, eight consonants of three elements each, and twelve consonants of four elements each.

This exchange of characters is carried one step further in the present system and "P" is also made to change with "W," for experience has shown that combinations of "P" with the vowels produce no syllables that are liable to be mis-

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read either when written or signaled, and the aim of the author all through the compilation of this work has been to foresee and eliminate as much as possible every risk likely to lead to error.

The Polyglot Stenocode employs only the eight consonants of three elements each, and the four vowels of two elements each, which, when combined, give thirty-two biliteral syllables invariably composed of one consonant of three impulses and one vowel of two impulses.

The letters thus used are D, G, K, N, R, S, T, P, A, I, U, Y, and are to be signaled as follows according to the type of apparatus used:

THREE-ELEMENT CONSONANTS.

Letter.	Signalled by Morse or Dot and Dash Method.	Signalled by Recorder or Reversal Method.
D	.. .. —	
G	... ... — —	
K	.. .. — . —	
N	.. ... — —	
R	... ... — . —	
S	.. ... —	
T	.. .. — — —	
P	.. — —	

TWO-ELEMENT VOWELS.

A	... .. —	
I	... ... —	
U	... ... — —	
Y	.. . — — . ..	

The effect of this arrangement, it is easily seen, is to give a direct gain of twelve and one-half per cent. in speed, combined with greatly increased accuracy, from the number of possible substitutions being substantially reduced, while most of the numerous class of errors caused by the running together or splitting of characters, failure of contact and misreadings, by which a letter may be converted into some other letter or letters, become capable of detection, and immediate correction, by each operator as the message passes through his hands, from the orderly sequence of consonant-vowel being interrupted.

This latter characteristic which Stenotelegraphy possesses in common with its elder sister Pantelegraphy, is in itself so self-evidently an immense aid to accuracy that it is to be hoped that the International Telegraph Conference will, at its coming meeting this year, see fit to amend its regulations so that all code words shall consist of biliteral syllables composed of consonant-vowel or vice versa. Such action on its part would remedy the complications and conflicts of interest which have arisen from the sole limiting qualification of pronounceability adopted by the last Conference, held at London, in 1903, while giving a great boon to the telegraphing public, a boon to the full value of which is only obtainable when it is a matter of professional knowledge to the operator that variation from the ordered sequence is, ipso facto, evidence of error.

A still further gain of twelve and one-half per cent. in speed is perfectly feasible if desired; for, since each three-impulse consonant is followed by a two-impulse vowel and no other combination is admissible, while five of the combinations are invariably used to form a word, it follows that the space after each letter, rendered necessary by the irregular number of impulses that may go to form a letter in the ordinary Morse code, may be eliminated, and the message transmitted as a series of dots and dashes and divided up into letters and words at the receiving station.

The increased speed and accuracy thus shown to be derivable from the transmission of Polyglot Stenocode words with only a slight modification of the alphabet at present in use, and consequently by means of the same apparatus, are in themselves great enough to justify the claim that the system satisfies the third requirement of an universal code, and affords advantages to the administrations which are commensurate with those it offers to the telegraphing public.

When, however, these words are transmitted by the Stenocode two-unit special alphabet shown below, in which the letters are formed on the Stenocode principle, but by the use of only such combinations as are transmissible by currents of uniform strength, and therefore requiring no change of existing automatic apparatus, these advantages become much more marked.

STENOCODE TWO-UNIT SPECIAL ALPHABET TRANSMITTED BY CURRENTS OF UNIFORM STRENGTH.

Letter.	Transmitter Slip.	Receiver Slip.
G or A	: •	
K or I	• :	
D or U	• :	
P or Y	: •	
N	: :	
R	: :	
S	: :	
T	: :	

It might be objected that the same symbols being used to represent two different letters would result in confusion, but this objection loses its apparent force when it is noticed that the same symbol never represents two consonants or two vowels, but always a consonant and a vowel, and it is remembered that these invariably occupy different positions in the thirty-two biliteral syllables of which the Stenocode words are composed.

For example, the accompanying illustration could only read "gapynusaki," for otherwise the

fundamental rule of consonant-vowel sequence would be violated.

Stenocode words expressed in this alphabet

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would invariably consist of twenty units as against the present average of forty units per code word, and thus a gain of fifty per cent. in the time required for transmission through each cable is obtained, while at the same time an immediate and efficient check on the accuracy of each word is placed in the power of each operator to apply as the message passes through his hands.

There are many other simple checks which could be employed to ensure accuracy when once the advantages of biliteral consonant-vowel code words, and the consequent shortening of the time required for their telegraphic expression, have been recognized by the administrations, and which are simply matters of preconcerted arrangement among them, but enough has been said to indicate the possibilities of the system in this direction.

Before concluding, however, the author would earnestly direct the attention of the cable companies, who are really the administrations most concerned, to the means herein provided for keeping down their working expenses by increasing the traffic capacity of their cables and clerks, as one solution of the problem confronting them of maintaining their dividends in the face of lowered tariffs and the increase of staff and other facilities that adherence to present methods would necessitate to deal with the resulting greater volumes of traffic.

The Telegraph as a Life Saver.

William Brady, a passenger traveling over the Mohawk and Malone division of the New York Central from Montreal to New York City, was stopped barelv in time recently from taking a poison given through mistake by a Montreal druggist. Brady has the telegraph to thank for escaping death.

Shortly before the train left Montreal Brady entered a drug store and requested that a prescription he had be compounded in a hurry, as he was about to leave the city. Soon after Brady had left the store with his medicine the druggist discovered that he had by mistake used a deadly drug in compounding the mixture. The druggist, thoroughly frightened, rushed to the Bonaventure station, and not knowing Brady's destination, or the train he left on, sent messages to several stations on the Grand Trunk and other roads, informing the man of the mistake which had been made.

One of these messages was sent to Tupper Lake, in the Adirondacks, and as the train stopped at that station the telegraph operator jumped on board and called Brady's name. Brady was at that moment standing at the water tank preparing to take the medicine. The mistake was explained and the medicine thrown away.

There are 1,653 male and 986 female operators in the London, England central telegraph office.

Wm. P. Davis, Western Union Chief Operator at Dallas.

William P. Davis, chief operator of the Western Union Telegraph Company, at Dallas, Tex., is a native of Omaha, Neb., where he was born forty-six years ago, in 1862. Like many another in the business, his telegraph career began in the messenger service and in his native place. This was in 1874. Shortly thereafter he drifted down to Dallas, finding employment in the Western

WILLIAM P. DAVIS.
Chief Operator, Western Union Telegraph Company, Dallas, Tex.

Union office, where he has since continuously remained, earning position and making a name for himself as an expert in his profession, high-minded of purpose, honorable in his dealings and steadfast in his friendships. In his present office he has served as clerk, clerk to the superintendent, operator, filling the positions of night chief and day chief, and now that of chief operator.

Insulation Resistance of Telegraph Lines.

In an article on telegraphy by W. Bubenik, appearing in a Vienna, Austria, technical journal, the Electrical World in an abstract of the same, says: In this mathematical article illustrated by diagrams, formulas are given for the loss of current due to imperfect insulation of the line against earth. The currents at the transmission end, as well as at the receiving end, depend on the insulation resistance of the line, as does also the magnetizing force of the telegraph apparatus. With a change of the insulation resistance due to weather or change of distance, etc., the magnetizing current of the instrument changes, and it may become necessary to adjust either the instrument or the voltage at the transmission end. The author prefers the last method, and shows that it is possible to subdivide the source of current so that lines of any insulation resistance may be connected to the source.

The new classified catalogue of books on the telegraph, telephone, wireless telegraphy, electricity, etc., published by TELEGRAPH AGE, may be had for the asking.

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Representative Western Union Men at St. Louis.

The office of the Western Union Telegraph Company at St. Louis, Mo., ranks well up toward the top of the list of larger offices in this country of the great system of which it is so important an integral part. Yielding to the growing necessities of the situation, the St. Louis headquarters were removed about a year ago (to be exact the final transfer occurred on the night of April 28-29, 1907), from 412-414 Pine street, premises long before outgrown, and where for seventeen years it had been located, to the present position in the Commercial Building, at Sixth and Olive streets, in the heart of the business district of the city. This edifice is an imposing one, architecturally considered, and the ample quarters occupied by the telegraph company, with its complete equipment, comprehensively perfect in every detail, meeting the multitudinous, exacting and intricate requirements of modern telegraphic demands—the office may well be accepted as a model. It is no wonder that the great staff centered here are proud of their environment. They may well be, for nowhere is there anything more completely designed to meet telegraphic needs.

In an article published June 1, 1907, this office was fully described, as well as its equipment and connections. In the same account an extended reference was also made to the chief members among the operating force of this office, as it then existed, as well as the length of service with which many of them were credited. The present article has more to do in specifically referring to a few of the heads of departments.

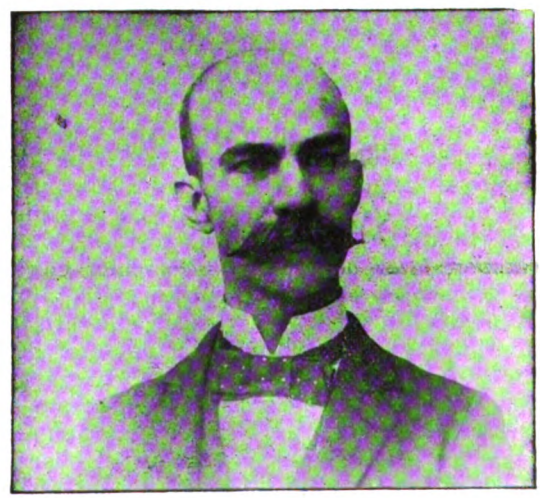
GEORGE J. FRANKEL, SUPERINTENDENT AT ST. LOUIS.

St. Louis is the headquarters of the superintendent of the second district of the Western division of the Western Union Telegraph Company, the office being filled by George J. Frankel. Mr. Frankel occupies an office on the seventh floor of the building, from which he directs the extended business pertaining to his district. He was appointed to his position early in 1902. He reached his fiftieth year on December 30 last, having been born at San Antonio, Tex., in 1857. Beginning business life when fifteen years of age, as a messenger boy in his native town, he subsequently went to Dallas as a telegraph clerk, going thence to Houston, where he acquired a knowledge of operating. As a manager in Western Union employ at Jefferson, at Marshall and at El Paso, although he showed much executive ability, he nevertheless left the commercial telegraph to accept the position of a train despatcher for the Texas and Pacific Railway, yet he was glad a year later to go back to the Western Union, which he did as manager of the office at Sherman. But Mr. Frankel was wanted for better things, and two years later he went to St. Louis as chief clerk to the superintendent. On May 1, 1897, he was appointed assistant superintendent to Theodore P. Cook, being elevated to the superintendency five years later, when Mr. Cook went to Chicago as general superintendent.

GEORGE J. FRANKEL.
Superintendent, Western Union Telegraph Company, St. Louis, Mo.

RUDOLPH H. BOHLE, MANAGER AT ST. LOUIS.

On September 28, 1907, R. H. Bohle completed twenty-one years of continuous service as manager of the Western Union Telegraph Company at St. Louis. He has been so long in this position and has become so thoroughly identified with telegraph interests, in particular with the company which he so admirably serves, that locally one is regarded as the synonym of the other. With added years of service comes a larger experience, a riper knowledge, and to-day Mr. Bohle is a better manager than ever before. He is popular among business men, and it may truthfully be said that Western Union interests do not suffer in his keeping. Perhaps this is due in part to the fact that Mr. Bohle is a native of St. Louis, the date of his birth being November 2, 1850, and on that account he feels a certain respon-



RUDOLPH H. BOHLE.
Manager, Western Union Telegraph Company, St. Louis, Mo.

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sibility attaching to his position, a dignity to maintain that possibly another, foreign to the place, would not be so sensitive to uphold. Be that as it may, of one thing we know, and that is his good stewardship remains unchallenged.

On November 6, 1861, young boy that he was, he became a messenger in the service of the United States Military Telegraph Corps in St. Louis, the first so employed. He soon learned the art of telegraphy, and after the close of the Civil War he entered the employ of the Western Union Telegraph Company, and when but shortly turned sixteen years of age, was appointed manager of the telegraph office at the board of trade. Here he remained for twenty years when his faithful service was rewarded by appointment to the office he now holds, endorsed for that post by a very general expression of approval by the business men of his city.

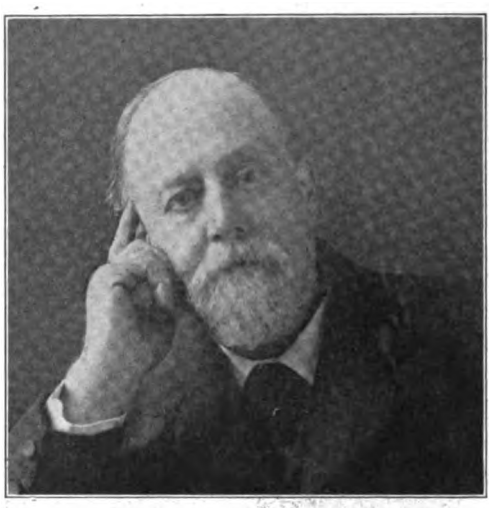
WM. E. BELLMAN, CHIEF OPERATOR AT ST. LOUIS.

William E. Bellman, the chief operator of the office at St. Louis, is a man now forty years of age. It was over twenty-three years ago that he began his telegraphic career, which he did in the railroad service on the Nickel Plate system. In the field of railroad telegraphy he became an adept, eventually rising to the position of train despatcher, later being appointed chief clerk to G. C. Kinsman, superintendent of telegraph of the Wabash Railroad, at Decatur, Ill. In 1889 Mr. Bellman was appointed chief operator of the office at Cedar Rapids, Iowa, later going to Kansas City. Seven years ago he became connected with the Western Union Telegraph Company, at St. Louis. His versatility of character is shown in the fact that during this comparatively short period of time he has successfully filled numerous offices of responsibility, including those of solicitor, manager of branch offices, division chief, traffic chief, and lastly that of chief operator. During the continuance of the World's Fair at St. Louis, he was given charge of his company interests at the exposition grounds.

WILLIAM E. BELLMAN.
Chief Operator, Western Union Telegraph Company, St. Louis, Mo.

COL. M. D. CRAIN, NIGHT CHIEF OPERATOR AT ST. LOUIS.

Colonel M. D. Crain, night chief operator at St. Louis, respected in the service of which he is a well-known and vigilant member, has behind him a long, honorable and varied record as a telegrapher, of which his abilities still keep him well to the front. Few there are who enjoy, and deservedly so, a finer reputation for probity of character and the qualities that go to constitute a gentleman. He is a soldier endowed with energy, equally exacting of and yielding to obedience, in the department over which he is in charge. With the newspaper fraternity he is on the best of terms, and on stormy nights the press has frequent occasion to accord him only words of praise. Born at Norwich, N. Y., April 1, 1841, Colonel Crain early in life showed abilities as a telegrapher. The story of his life has often been told, yet in brief it may be recapitulated that in 1858 he opened every telegraph office on the line of railroad between Terre Haute and St. Louis. He served as a military telegrapher throughout the war, and was present at many of its hard fought battles. In 1863 he was appointed chief operator of the military office at St. Louis, by Colonel Robert C. Clowry, now president of the Western Union Telegraph Company, as a reward for meritorious conduct in the field. He has been connected with the Western Union Telegraph Company at St. Louis since 1871, excepting for a brief period of service at Kansas City. He was appointed to his present position in March, 1892.



COL. M. D. CRAIN.
Night Chief Operator, Western Union Telegraph Company, St. Louis, Mo.

HENRY GOSTING, ASSISTANT CHIEF OPERATOR AT ST. LOUIS.

Henry Gosting, assistant chief operator at St. Louis, is another bright member of the operating staff at that point, a young man still who by his integrity of purpose, and ability to do things, is winning his way upward in the line of telegraph advancement. He was born thirty-five years ago

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and entered Western Union employ in 1887, as a check boy. Such was his aptitude, however, for the profession in which he had embarked, that two years later, after he was well grounded in the art of telegraphy, he was appointed manager of the office at Camden, Ark. Subsequently he served as an operator in the St. Louis office, where

HENRY GOSTING.
Assistant Day Chief Operator, Western Union Telegraph Company, St. Louis, Mo.

he gained much experience, later spending two years at the key in Chicago. Returning to St. Louis his rise has since been rapid, for during the last four years he has filled with much acceptability the positions of division chief, assistant wire chief and now that of assistant to Mr. Bellman.

ARTHUR MITCHELL, NIGHT FORCE CHIEF AT ST. LOUIS

Arthur Mitchell, Sr., night force chief in the St. Louis office, has a record of over twenty years of continuous service in that office. He is recognized as a man of varied business accomplish-

ARTHUR MITCHELL, SR.
Night Force Chief, Western Union Telegraph Company, St. Louis, Mo.

ments, and conducts his office with a firm hand, yet in such a manner as to command the respect and confidence of employes. Two events in 1893 brought Mr. Mitchell prominently before the local telegraph fraternity, namely, the successful management of a telegraph tournament and a go-as-you-please walking match. Mr. Mitchell possesses a highly artistic temperament, and outside of the sphere of telegraphy, to which he devotes himself assiduously when others sleep, he has achieved considerable success and is recognized as a landscape painter of merit. He is a member of the St. Louis Artists' Guild, and is a regular exhibitor at the Society of Western Artists. He was awarded a diploma of honorable mention at the Lewis and Clark Exposition.

F. E. PATRICK, TRAFFIC CHIEF, BARCLAY DEPARTMENT, AT ST. LOUIS.

Frank E. Patrick, traffic chief of the Barclay department, in the St. Louis office, was born at Manhattan, Kan., July 14, 1873, and entered the service of the Western Union Telegraph Company at the age of fourteen as a messenger at Springfield, Mo. He has remained with that company almost continuously since then excepting three years spent at the Northwestern University, Evanston, Ill., and one year during the Spanish-

FRANK E. PATRICK.
Traffic Chief, Barclay Department, Western Union Telegraph Company, St. Louis, Mo.

American War, when he was appointed captain of Company F, Ninth United States Volunteer Infantry, by President McKinley. For a time he was in charge of the department of claims of this company. Mr. Patrick is a Shriner and a member of the famous St. Louis Moolah patrol. It will interest many friends at St. Louis to state that Mr. Patrick is the agent in that city for Telegraph Age in Western Union circles.

The Postal Telegraph Clerks' Association of Great Britain, held its twenty-eighth annual conference in Glasgow April 9 to 11. It was reported that the association numbered 8,748, with 246 branches. It was agreed to grant three seats to women on the executive body, and to place the sole responsibility of management in the hands of the executive.

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The Rugh Composite Telegraph and Telephone System.

The patent recently granted to Harry O. Rugh, of Sandwich, Ill., for a composite signaling and telephone system, numbered 882,347, relates to electrical systems for transmitting intelligence, and finds a most useful embodiment in composite signaling and telephone systems wherein the same line conductors act to convey telephonic and telegraphic currents. In the usual embodiment of this invention, a transmission line is employed to connect telegraph stations and telephonic outfits are connected between said telegraph stations. Where the telephonic outfits are connected with the transmission line, two sets of coils are employed, preferably each containing two coils preferably of the same ohmic resistance, one of each pair of coils possessing high impedance and the other preferably little or no impedance. The telephone receiver has its terminals connected or adapted for connection with the two sets of coils, the connection of one telephone receiver terminal being between the coils of one set or pair and the connection of the other telephone receiver being between the coils of the other set or pair. One impedance coil is interposed between one telephone receiver terminal and one telegraph station and the other impedance coil is interposed between the other telephone receiver terminal and the other telegraph station. One non-inductive resistance coil or connection is connected between one telephone receiver terminal and one telegraph station and the other non-inductive resistance coil or connection is connected between the other telephone receiver terminal and the other telegraph station. By this arrangement, the telegraphic currents find access through the two sets of coils in parallel. The impedance coils force said incoming telephonic current through the non-inductive resistance coils or connections and the telephone receiver associated therewith. In short, it will be seen that it is provided at each telephone station a quadrilateral, two opposite sides of which contain the impedance devices that have been described, while the other sides of the quadrilateral include means whereby the telephonic currents may be conveyed. These latter sides of the quadrilateral may, if it is desired, include impedance windings that are shunted by condensers, the condensers permitting the passage of telephonic currents while the impedance devices permit the passage of telegraphic currents.

What Mr. Rugh claims as being new in his invention is summed up as follows:

1. In a composite telegraph and telephone system, the combination with a transmission conductor affording passage for telegraphic current, a plurality of telegraph stations connected thereby, a plurality of telephone stations also connected thereby, said transmission conductor normally permanently extending to all of said telegraph and telephone stations, a quadrilateral of connections at each telephone station, the telephone receiver circuit at each telephone station having one terminal connected between two of a pair of the sides of said quadrilateral and the other terminal connected between the two sides of the remaining pair of sides of said quadrilateral, the said pairs of sides of said quadrilateral each being connected in series with the transmission conductor, the telegraph stations also being in serial relation with said quadrilateral, opposite sides of said quadrilateral possessing impedance to telephonic current and being interposed between the associate telephone receiver circuit and the telegraph stations while the remaining sides of said quadrilateral afford passage for voice currents, all of the sides of said quadrilateral affording passage for telegraph currents.

2. In a composite telegraph and telephone system, the combination with a transmission conductor affording passage for telegraphic current, a plurality of telegraph stations connected thereby, a plurality of telephone stations also connected thereby, said transmission conductor normally permanently extending to all of said telegraph and telephone stations, a quadrilateral of connections at each telephone station, the telephone receiver circuit at each telephone station having one terminal connected between two of a pair of the sides of said quadrilateral and the other terminal connected between the two sides of the remaining pair of sides of said quadrilateral, the said pairs of sides of said quadrilateral each being connected in series with the transmission conductor, the telegraph stations also being in serial relation with said quadrilateral, opposite sides of said quadrilateral possessing impedance to telephonic current and interposed between the associate telephone receiver circuit and the telegraph stations while the remaining sides of said quadrilateral afford passage for voice currents, all of the sides of said quadrilateral affording passage for telegraph currents, conductors extending from the transmission conductor and completing the telephonic circuit, and condensers in said conductors.

3. In a composite telegraph and telephone system, the combination with a transmission conductor affording passage for telegraphic current, a plurality of telegraph stations connected thereby, a plurality of telephone stations also connected thereby, said transmission conductor normally permanently extending to all of said telegraph and telephone stations, a quadrilateral of connections at each telephone station, the telephone receiver circuit at each telephone station having one terminal connected between two of a pair of the sides of said quadrilateral and the other terminal connected between the two sides of the remaining pair of sides of said quadrilateral, the said pairs of sides of said quadrilateral each being connected in series with the transmission conductor, the telegraph stations also being in serial relation with said quadrilateral, opposite sides of said quadrilateral possessing impedance to telephonic current and interposed between the associate telephone receiver circuit and the telegraph stations while the remaining sides of said

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quadrilateral afford passage for voice currents, all of the sides of said quadrilateral affording passage for telegraph currents, and conductors extending from the transmission conductor and completing the telephone circuit.

Telegraph Reminiscence.

David Homer Bates, of New York, although now and for many years past no longer in the telegraph service, of which formerly he was a bright ornament, is nevertheless, even in the midst of a busy life, loyal to its best memories and illustrious traditions. Old timers know him to be a veritable encyclopedia of telegraphic lore, abounding with information of scenes, events and personages of long ago, which he delights to place at the disposal of all who may be interested. This, in fact, he sturdily holds to be part of the duty of life incumbent upon all old timers who are in possession of data of like character, especially if it be of historic value. Attracted by the large amount of reminiscent matter which has appeared in TELEGRAPH AGE during the past year, Mr. Bates a short time ago wrote to this Journal pronouncing warm approval of the policy of management that encouraged such contributions, and expressed the hope that many others who had anything good of like nature to communicate would do so through these columns.

Mr. Bates' suggestion is to be commended. There are a number of former telegraphers in New York, as well as elsewhere, who have met with success in life, many of them in abundant measure, in the pursuit of other avocations that have engaged their attention since they quit the key. In common with most telegraphers these men still retain a fondness for the friendships formed in the early days, for the genuine telegrapher is an individual of gregarious tendencies, and the remembrances of those cherished times, and of contemporative happenings within the fraternal sphere, are of a character usually to awake enthusiasm and interest in their recital.

In the effort to arouse a few of the aforesaid old timers to a realizing sense of the obligation which Mr. Bates said they owed to the guild in which formerly they were in close fellowship, and which will not allow them to become disassociated, Telegraph Age wrote a few days ago to J. Frank Howell, now a successful banker and broker in the Wall street district, with a view of enticing that gentleman into print with a chronicle of incidents, relating to the telegraph of—well, of the time when he was included in the ranks. A characteristic reply has been received from Mr. Howell, dated, not from his business office, but at the point which claims his best affections, namely, "Oakview Stock Farm," over at Englewood, N. J., where, when not engaged in financial operations, Mr. Howell is acting the part of an enthusiastic farmer. He refers to the scope and delightful nature of his work on the farm, and the fact that the dual character of his occupations leave him but little time to attempt anything further; expressing fear, indeed, that cold type would make what he might say too chilly for general perusal. But warming up with recollections, stirred by the subject, he exclaims with fervor: "I never had such times as we have had on the Old Timers' trips, and enjoyed them because I could always find such agreeable companionship." Then he goes on to say that "telegraphic reminiscenses are always interesting and it is a pity there are not more of them published, especially when if covered, as they might be, by a great number of pens." With the evident desire that he may be able to respond favorably to our request for a reminiscent article, yet perhaps, and it may be naturally so, reluctant to begin on such an undertaking, Mr. Howell concludes his letter: "Should a few spare moments disentangle themselves from the shrubbery, garden, flowers, pigeons, ducks, turkeys, Berkshire pigs, of which I have more than twenty; and the horses and the farm in general, I will try to work them out in a 'slow heat' along the lines laid down."

Addresses of Surviving Members of the United States Military Telegraph Corps Wanted.

The executive committee of the United States Military Telegraph Corps would like to have on file an up-to-date list of all members of the corps with their post office address in each case, together with the date and serial number of their certificates of honorable service under the Act of Congress of January 26, 1897; and especially the following names, in regard to whom the executive committee has received no recent data:

George Allison, Edw. C. Boyle, Henry Bowerman, John A. Cassell, Charles E. Chandler, Achilles P. Cochrane, A. D. Daugherty, John Dinan, William M. DeGrove, Frank H. Evans, George M. Farnham, Isaac C. Groomes, John M. Geiger, Martin E. Griswold, Joseph Hansen, Henry P. Hull, George S. Holmes, William E. Hertford, Minard Y. Holley, Francis M. Ingram, Seeley B. Knapp, Stewart W. Knapp, John P. Lathrop, Hector Lithgow, Charles H. Lithgow, Frank C. Long, William McCormick, I. T. McCloskey, Peter J. Murray, William S. Maynard, Henry S. Martin, James S. O'Brien, L. Ford Perdue, Amos C. Paxson, Charles H. Palmer, Jesse Ruggles, R. H. Ryan, Byron L. Robinson, Irving C. Showerman, Simon S. Small, William K. Smith, Andrew C. Schnell, Frank Spare, Henry C. Sprague, John W. Smith, John Scanlon, Ellis Stone, Joseph T. Tiffany, William E. Tinney, George Turner, George J. Talmage, Henry R. Trowbridge, Rudolph C. Voelker, L. W. Wortsman, J. S. Williams, John C. Wagner, H. W. West and A. A. Zion.

If this notice should catch the eye of any of those whose names appear herewith or of others who are able to supply the addresses, a postal card with the desired information will be welcomed and acknowledged by David Homer Bates, 658 Broadway, New York.

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Letters from Our Agents.

PHILADELPHIA, WESTERN UNION.

H. V. Hudgens, of this office, was married April 29 to a Virginia lady.

Manlove Smith has returned to this office after a sojourn of two months at Jacksonville, Fla.

The many friends of George Snyder, who was one of the original printing operators back in the sixties, will be pleased to learn that he is recovering from a very severe and painful operation which was successfully performed in this city recently.

ST. LOUIS, WESTERN UNION.

Through the courtesy of Superintendent George J. Frankel and Manager R. H. Bohle, two large waiting rooms have been opened on the seventh floor of the Commercial Building, in connection with this office, for the convenience of the operating force. One room is designed exclusively for the women operators and the other room is for the male sex. These rooms have large windows admitting air and light, and are well furnished with tables and chairs. The daily papers and Telegraph Age are on file, all of which are contributed by the operators.

The St. Louis Barclay department displays a full page portrait of John C. Barclay, the inventor of the system, and the assistant general manager of the company and its electrical engineer. This picture appeared in the anniversary number of Telegraph Age and has been placed in a neat black frame. It is regarded as a fine likeness.

Samuel Sullender, an operator in this office, and Miss Alice Bagot, also an operator and formerly employed here, were married April 20.

Paul Rainey, for several years employed as an operator for this company in this city, and Miss Anna C. Sarenson, of Salt Lake City, were married at Ogden, Utah, March 15.

NEW YORK NEWS.

Assessments Nos. 477 and 478 have been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of John H. Kelly, at Brooklyn, N. Y.; William Olver, at Philadelphia; Alexander K. Marshall, at North Fork, Ky.; John P. Meder, at Carson, Nev.; David H. Christie, at Brooklyn, N. Y.; Thomas S. Young, at Mount de Chantall, W. Va.; George H. Wilson, at Los Angeles, Cal.; John Burry, at Staten Island, N. Y.; Thomas E. Maddex, at Bayonne, N. J.; Edmund W. Firmin, at New York.

Good Telegraph Delivery Service in England.

"Harry Johnstone, spectator, international football match, Glasgow," was the address on a telegram from Leeds, England, recently. The post office messenger found the correct Johnstone in the crowd of 121,000 that witnessed the game.

Mr. S. A. Duncan, of Atlanta, Ga., in renewing his subscription, observes: "I have been a subscriber to Telegraph Age so many years that I look for it almost as regularly as I do for my meals. I am glad to see the continued improvement and advance made by the paper, and trust that notwithstanding the panic the Age may continue to prosper."

"Lightning Flashes and Electric Dashes," a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; price, $1.50, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Why not save your money and acquire the ownership of a home? The Serial Building Loan and Savings Institution, 195 Broadway, New York, offers a safe depository for the one and will aid you in securing the other under a system making such acquisition possible and easy. This is the telegraphers' bank, and it has been of aid to thousands.

Advertising will be accepted to appear in this column at the rate of three cents a word, estimating eight words to the line.

Will buy or sell, in one to ten-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

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No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

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Attaches to the frame of the typewriter and is a part of its keyboard. It reduces breaking to a mere motion of a finger instead of the old tiresome reach back of the machine to the wire.

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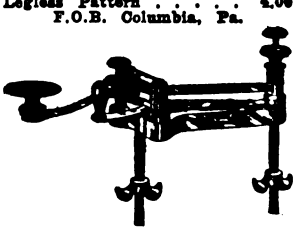

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Commercial Cable Co., Commercial Pacific Cable Co., German Atlantic Cable Co., W. D. Francis, purchasing agent, 14 Desbrosses St., New York.

Great North Western Telegraph Co. of Canada, Geo. D. Perry, purchasing agent, Toronto, Ont.

North American Telegraph Co., H. A. Tuttle, general manager and purchasing agent, Minneapolis, Minn.

Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

Postal Telegraph-Cable Co. of Texas, S. M. English, general manager and purchasing agent, Dallas, Tex.

Western Union Telegraph Co., Executive Offices, 195 Broadway, New York; purchasing agent, H. E. Roberts, 152 Franklin Street, New York.

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Of this fine publication, becoming more and more valuable as time passes, we have but a few copies left. The original price was $5. In order to readily dispose of these remaining volumes, and place them where they rightfully belong, in the hands of every telegrapher who failed to secure a copy at the higher original price, we have cut the figure to $1 a volume. On receipt of this amount the book will be sent to any address, express charges to be paid by the purchaser. At this low rate, a sum below the cost of binding the book even, no telegrapher who desires to own a copy should fail to obtain one at this time, for this "bargain" price can never be repeated, as the book will soon be out of print. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

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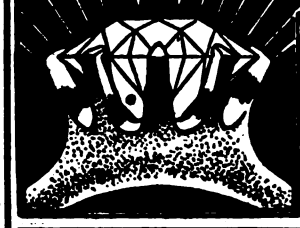

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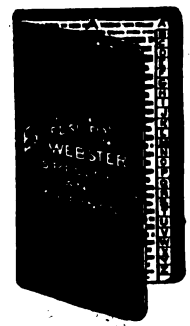

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Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

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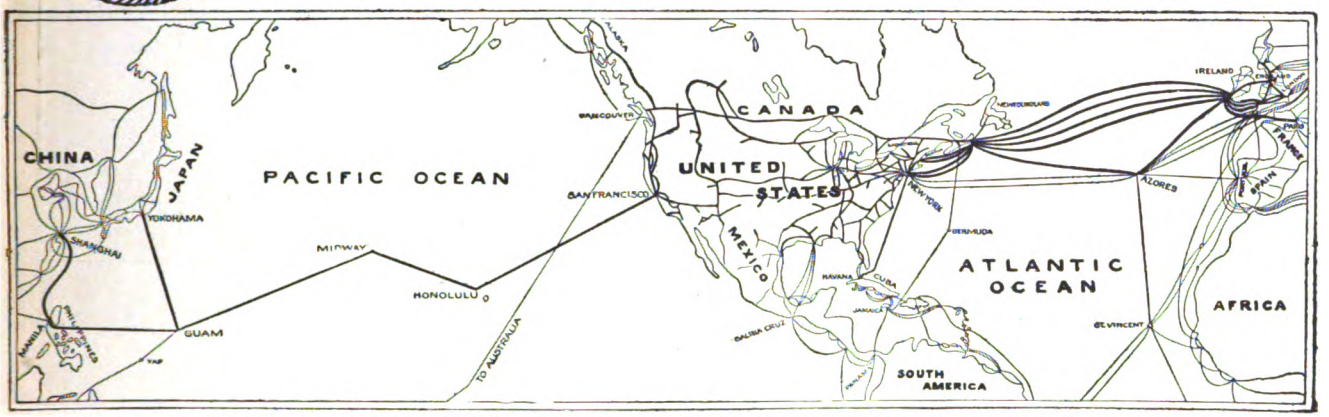

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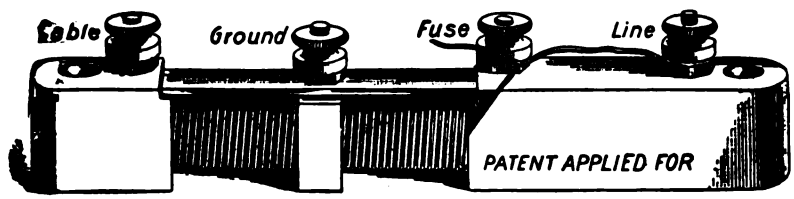

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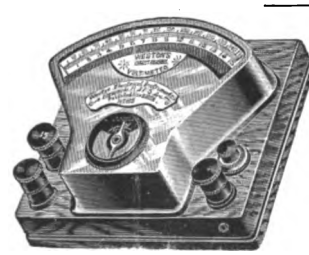

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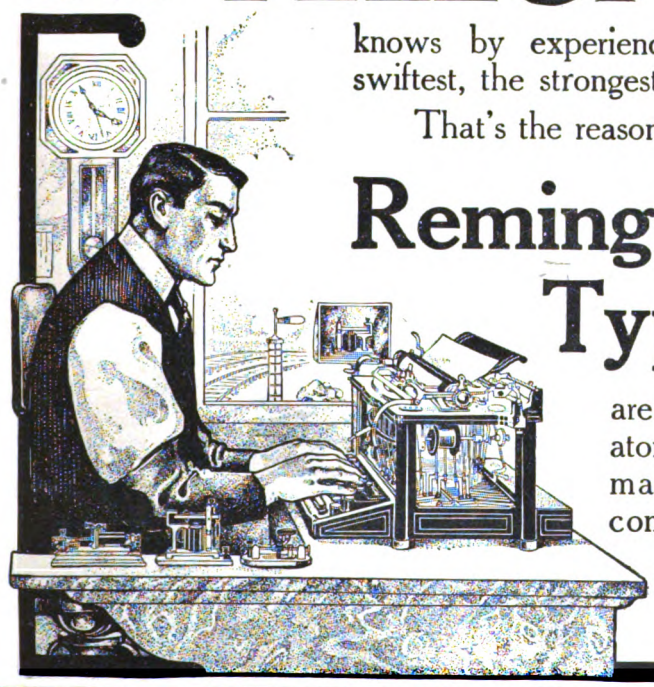

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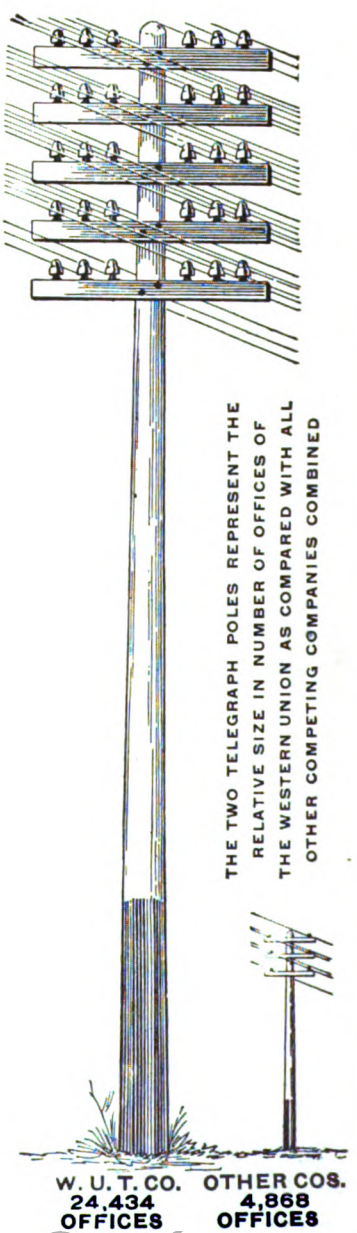

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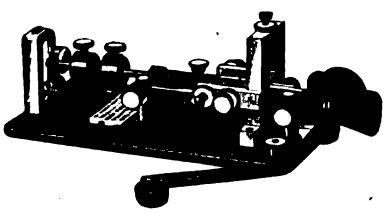

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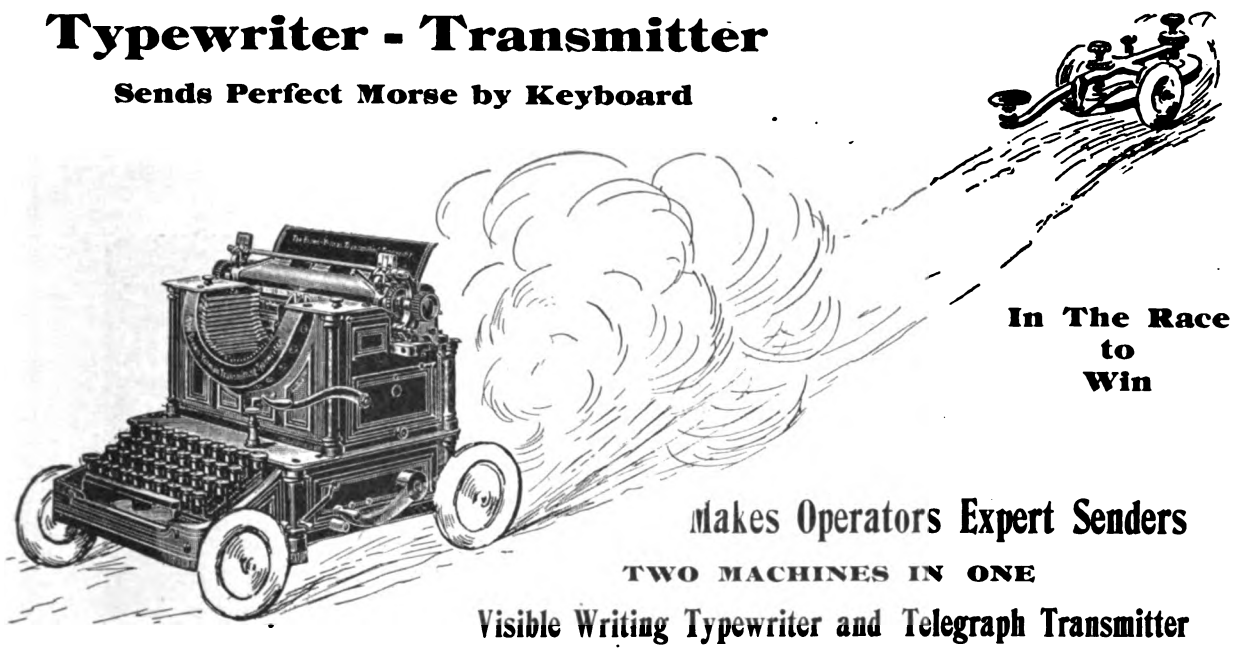

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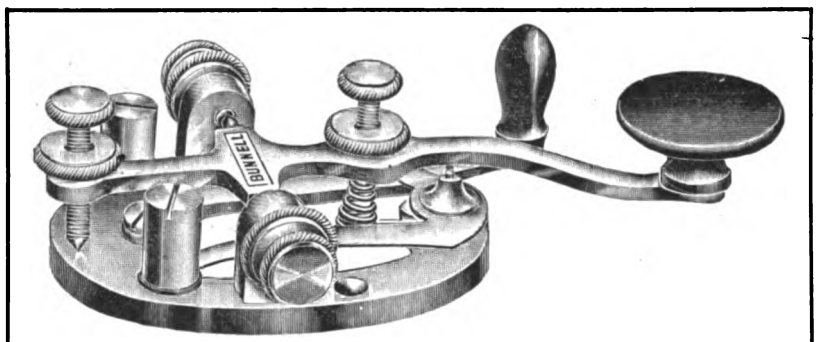

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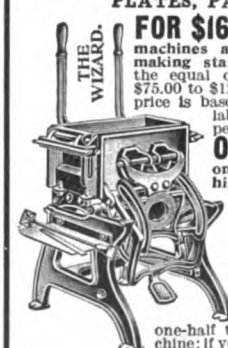

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No. 10. NEW YORK, MAY 16, 1908. Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

The Freir Self-Polarizing Quadruplex Relay.

BY WILLIS H. JONES.

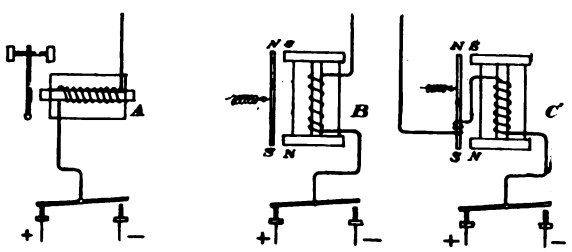
Because of the term "self-polarizing" being applied to the Freir relay there are a great number of operators who have the erroneous impression that Mr. Freir's quadruplex instrument for the common side of the circuit is merely a companion "polar" relay which responds to "direction" of current in the same or similar manner as its partner on the first side of the table.

This, however, is not the case. Its operation depends entirely upon alterations in the volume of current flowing irrespective of its direction. In this respect it is identical with that of the old neutral pattern. The distinction between the two types is that in the old pattern the soft iron armature is moved by the mere attractive force of the relay magnet alone; that is to say, without any inherent power or tendency in the armature itself to help in the operation, while in the Freir pattern the self-polarizing of the armature by means of the multiplex current creates a little magnet of the lever and settings, each pole of which possesses a natural inclination to move toward the relay magnet having a radiation of opposite lines to itself, and thus tends to assist the relay magnet. In order to take advantage of this property of a polarized movable armature lever then, it is simply necessary to arrange the coil winding in such a manner that the conditions in the magnetic circuit are favorable.

To illustrate this point let us note the magnetic effects obtained by the three arrangements shown in figures A, B and C, respectively, in the accompanying diagram.

A is an ordinary single line relay. B is practically the same thing somewhat differently constructed and possesses a lever armature consisting of a bar of hard steel which is permanently magnetized. The latter therefore possesses a north and a south pole of its own created by the magnetic lines of force it normally contains.

Now, the full or attractive strength of any magnet is equal to the square of the number of magnetic lines of force flowing through its iron core, hence, as shown in Fig. A, the pull can be no greater than that due to the lines of force the current alone creates, as the soft iron lever armature neither adds to nor diminishes the magnetizing energy.



FIGURES A. B. AND C.

In Fig. B, however, the steel armature being itself a magnet commingles its lines of force in the magnetic circuit when they flow in the same direction, and thus creates a stronger relay (other conditions of the magnetic circuit being equal). In other words, we have the combined strength of two magnets working in unison instead of one in the old, or neutral pattern.

If the lines of force in the steel armature (referring to the magnetic circuit) should happen to flow in the opposite direction to those in the relay core, or, in other words, oppose the latter, it is obvious that the total strength of the relay would be weakened to the extent that the former opposes. A permanent magnet, therefore, cannot be used for the armature of a common side relay where the polarity of the main line circuit, or magnetizing currents, is subject to alterations.

If, however, we substitute an electro-magnet for the steel bar in series with the relay coil, as shown in Fig. C, and arrange the winding thereof

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in such a manner that the same current which magnetizes the relay core simultaneously magnetize the extra electro-magnet, the soft iron lever armature of the latter may be polarized inductively with the advantage that its polarity will change to meet each alteration in the relay and thus preserve the existing relationship between their respective signs regardless of the alterations in the polarity of the line current. The "pull," therefore, will be the same with either positive or negative current.

In the Freir relay for the common side of a quadruplex circuit the inventor has taken advantage of this knowledge in the construction thereof, as may be seen by a glance at Fig. D, which shows an end view of the three coils, two of which, b and c, correspond in construction with that shown in Fig. C, coil A being the usual companion spool as in the case of an ordinary neutral relay. Of course, this instrument, including the armature coil B, is differentially wound, although for simplicity it is not so shown in the accompanying cut.

In this relay the winding of the armature coil B and that of C is such that the same current

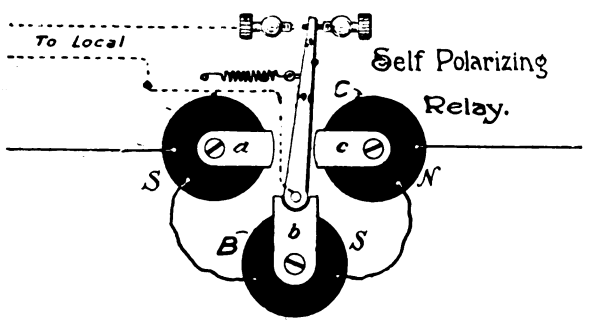

FIG. D.

flowing through each produces an opposite polarity in the iron terminals of one from that of the other. If B is positive and C is negative a change in the direction of the current merely causes the signs of the respective magnets to exchange places, but does not prevent or lessen their attraction for each other in the least.

It follows, then, by stiffening the retractile spring to a degree that will keep the armature b from being pulled over to the local contact point by the strength of the "short end" or weaker current, the lever may nevertheless be actuated by an increase of current from the distant end, which is purposely made strong enough to overcome the spring tension.

The question has frequently been asked, Why, considering the fact that coil A must be moved so far away from the lever armature for best results, the left-hand coil is necessary at all, and whether it would not be possible to operate a relay on a multiplex circuit with that coil entirely eliminated?

In reply we will say that such a thing is possible; that is to say, it would work fairly well when the wire, weather, and other conditions are favorable, but so far as that goes, any old type of relay might do the same. In fact, a two-coil relay similar to that shown in Fig. C represents an English relay invented by Stroh, but as it never became very popular the indication is that it possessed a weakness. The third coil, added by Mr. Freir, is an improvement thereon, and as its action is evidently one of the factors which gives his relay its well known efficiency it follows that coil A cannot be ignored. All quadruplex attendants know that by merely altering the position of coil A better results are often obtained, hence there is no denying it plays its part.

As to the necessity of moving coil A some distance from the lever the following information will afford an explanation: The mass of iron in the armature is very small as compared with that in the cores, hence it is evident that if coil A has a much more intense field than B (the armature), the latter is liable to have its lines overpowered, being a feeble north, and A a stronger north, thus giving C the south pole, a greater opportunity to complete its lines of force through those of A instead of B and thereby only feebly or sluggishly attract the lever. For this reason coil A must be weakened by removing it a certain distance, and that distance is the point where the magnetic strength of the combination AB is identical with that of C. If A, B and C possessed equal magnetic strength of, say, 10 each, the armature would probably not have more than 6, hence A is moved back so B may have the necessary help to control the lever. When these conditions exist the magnetic field seems to have a maximum solidity or steadiness, each coil in a way tending to compensate any unevenness in the other.

Other factors which make for the efficiency of this relay are the absence of a yoke, freedom of armature movement, small self-induction and others fully described in the preceding article, appearing May 1.

As to the comparative merits of the Freir and the old type neutral relay it may be said that there are certain conditions where each has an advantage over the other. The yoke of the latter tends to give it a strong magnetism with an accompanying slow time constant, while the former is much quicker in action.

In a choice, therefore, for a standard instrument, so far as the Western Union Telegraph Company was concerned, guidance in the matter was very much after the manner one would pursue in selecting a horse, it all depends upon whether a truck, race, or family horse is most serviceable for general work. After a thorough trial by that company the Freir relay was considered the most suitable for all around work and finally was made its standard.

Recent Telegraph Patents.

A patent, No. 885,545, for a telegraph sounder, has been granted to James J. Thomas, of Whiting,

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Iowa, and Albert G. Christopherson, of Scribner, Neb. The patentee has a pivotally mounted electromagnet, the poles of which move toward and from the fixed poles of a permanent magnet. Is intended to be more sensitive than the present type of sounder.

A patent, No. 885,688, for a relay, has been issued to Archibald S. Cubitt, of Schenectady, N. Y. Relay having current carrying coil and a core movable in the magnetic field thereof, and a frame serving as a path for the flux and as a magnetic shunt around said core. Includes means for varying the reluctance of the shunt path.

The following patents have expired:

Patent No. 450,630, for a printing telegraph, held by S. R. Linville and L. F. Hettmansperger, of Philadelphia.

Patent No. 451,449, for a telegraph repeater, held by A. C. Booth, of Cedar Rapids, Iowa.

Personal.

Mr. W. S. Burnett, of Milwaukee, electrical engineer of the Morse Code Signal Company, of that city, was in New York on May 4.

Dr. Leslie C. Love, of Montclair, N. J., and Miss Edith Manson, daughter of Mr. George T. Manson, general superintendent of the Okonite Company, New York, were married on April 21.

Mr. Orrin S. Wood, the first telegrapher in the world, has left New York for his country home at Turner, Orange County, N. Y., where he will spend the summer according to his usual custom.

Mr. A. L. Suesman, at one time and for many years, the general Western manager of The United Press, at Chicago, and early in life manager of the Providence, R. I., office, is now engaged in doing editorial work for the American Institute of Electrical Engineers, New York.

The cornerstone of the beautiful new building of the International Bureau of the American Republics, Washington, D. C., was laid on Monday afternoon, May 11. Major J. O. Kerbey, an old-time telegrapher, is at the head of one of the departments of this bureau.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Belvidere Brooks, general superintendent of the Eastern division, attended the shad dinner on Saturday, May 9, at Philadelphia, tendered by the John A. Roebling's Sons' Company, an event which is celebrated annually.

There has been installed in the offices of this company at St. Louis and Kansas City a number of motor generators which, it is said, possess features of improvement not found in other machines of this character. These motor generators are the product of the General Electric Company. The St. Louis plant, consisting of twenty machines, was installed by H. S. Graber, the chief engineer of the telegraph company. The improvements embraced in these machines include the insertion of a fan which causes a forced circulation of air through the machine, thus greatly helping to keep down the temperature. These machines are excited from the primary, or 110-volt current. They also have laminated pole shoes and a large number of armature coils, thus giving a lower voltage between adjoining commutator bars; also, an improved brush holder, making a firmer contact between holder and brush.

Mr. J. Levin, general superintendent at Atlanta, Ga., has just returned from a tour of inspection covering the second and third districts of his division, being accompanied by G. W. Lloyd and B. F. Dillon through their respective districts.

RESIGNATIONS AND APPOINTMENTS.

F. J. Krumling, chief operator at Toledo, Ohio, was on May 1, appointed manager of that office to succeed J. F. Rawie, who resigned to remove to California. J. S. Reichert, formerly wire chief, succeeded Mr. Krumling as chief operator, A. A. Patterson being made wire chief.

O. L. Michaels, manager at East Las Vegas, N. M., has been appointed manager at Colorado Springs, Colo. He will be succeeded at the former place by F. D. Nash.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mrs. John W. Mackay, the mother of President Clarence H. Mackay, and his sister, the Princess Colonna, sailed for Europe on the Kronprinzessin Cecilie, on May 12.

Mr. H. J. Kinnucan, superintendent at Detroit, Mich., was a recent visitor.

Mr. Henry Scrivens, who for the past eight years has been chief clerk to E. G. Cochrane, general superintendent, has been appointed chief clerk to Charles C. Adams, second vice-president. The vacancy caused by the promotion of Mr. Scrivens has been filled by the advancement of A. H. Clarke, division cashier, the latter position being filled by the appointment of A. B. Parrish, stenographer.

The Chicago, Milwaukee and St. Paul Railway on May 4, organized and incorporated in Butte, Mont., the Continental Telegraph Company, capitalized for $300,000. The St. Paul's contract with the Western Union Telegraph Company expired May 1. The new company will do a general commercial business, and the Continental Telegraph Company will cover the territory along the 10,000 miles of the St. Paul Railway when completed to the Pacific Coast, and have connections with other telegraph companies.

The articles under the standing head of "Some Points on Electricity," published regularly in TELEGRAPH AGE, are filled with practical information for the up-to-date operator. Send for a sample copy.

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The Railroad.

Mr. E. H. Millington, of Detroit, superintendent of telegraph of the Michigan Central Railroad Company, was a recent New York visitor.

The New York Central Railroad Company has closed its telegraph school at Albany for the summer, and possibly for an indefinite period. The reason for this action is that the company now has a surplus of operators. C. A. Wood, who has had charge of this school, has been assigned to duty in the office of the assistant general manager, P. E. Crowley, at Albany.

Mr. L. H. Korty, superintendent of telegraph of the Union Pacific Railroad Company, at Omaha, Neb., has resigned on account of continued ill health and has retired permanently from active business. He was appointed assistant superintendent of the road in 1881, and succeeded to the superintendency in 1887. He is succeeded by J. B. Sheldon, who has been Mr. Korty's assistant for many years.

As the time approaches for the holding of the convention of the Association of Railway Telegraph Superintendents, at Montreal, Que., on June 24, 25, 26 and 27, the prospects for one of the best and most numerously attended of meetings daily grows brighter. The convention numbers of Telegraph Age will embrace two issues, the first to be published on June 16, copies of which will be distributed at the convention itself, and the second on July 1, in which the full story of the convention will be printed.

In order that readers may not receive a possible wrong impression respecting the distances covered over which combined telegraph and telephone working on lines of the Canadian Pacific Telegraph system is concerned, mentioned in this column on April 16, it is well perhaps, in order to make the statement referred to more clear, to say that the distance so worked from Montreal to Fort William, a repeating point, is 995 miles, while the entire distance from Montreal to Winnipeg is 1,415 miles.

The May meeting of the Railway Signal Association was held in the Engineering Building, New York, on Tuesday, May 12. The subject in the forenoon was "Specifications for Electric Interlocking." In the afternoon a paper on storage batteries, by H. M. Beck, was read. Mr. Beck discussed the restoration of low cells. The secretary announced that as Mr. Beck treated his subject with reference to a single type of storage battery, it is desirable that makers of other storage batteries which are used for signal purposes should be represented at the meeting, with a view to bringing out the best methods of dealing with all kinds of storage batteries which may need restoration, and they were accordingly invited to be present.

The spring session of the American Railway Association was held at the Hotel Belmont, New York, April 22. There were present two hundred and twenty-five delegates, representing one hundred and fifty members. The executive committee reported that the membership of the association now comprises three hundred and thirty-eight members, operating 240,770 miles; and the associate membership forty-four members, operating 1,630 miles. An election of officers resulted in the selection of F. A. Delano, president of the Wabash road, president; W. A. Gardner, vice-president of the Chicago and North Western Railroad, second vice-president. The next meeting of the association will be held at Chicago, on November 18.

The Railroad Commissioners of New Hampshire blame the federal government for a butting collision of freight trains which happened near Haverhill, in that state, on March 20, and in which five men were killed and two others injured. It is reported because of the federal statute the road "had to hire young and inexperienced operators." The collision was due to the dropping of the word "East" from a telegraphic order directing the trains to meet at East Haverhill, making it read "Haverhill." It is preposterous to place the blame on the law as causing the accident. If the telephone had been in use on this railroad and had been brought into requisition the accident probably would not have occurred. One decided advantage of telephonic train orders over telegraphic train orders, is that the person receiving the order over the telephone personally executes it, whether it be the conductor or the engineer. In this specific case had the conductor received the order by telephone the repeating of the words "East Haverhill" several times would most likely have made a lasting impression on his mind, so that, if by any chance he had neglected to write the word "East" on his order, it would have become apparent to him on reading the order over that something was wrong, and he would naturally have sought its verification before attempting its execution.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we have sometimes in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas, in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum named or even more. The growing value of complete files of Telegraph Age should cause our readers to carefully preserve their issues.

The story of the rise of Francis T. F. Lovejoy from the position of a telegraph operator to that of a multi-millionaire, told elsewhere in this issue, will be read with the interest attaching to such a remarkable career.

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Radio-Telegraphy.

A patent, No. 886,303, for a spark-gap apparatus, has been issued to Walter W. Massie, of Providence, R. I., assignor to the Massie Wireless Telegraph Company, Providence.

As a result of the disagreements between the French Cable Company in Venezuela and President Castro, it is stated that President Castro has taken steps to install five wireless stations at different towns to supplant the cable company. E. C. Newton, a representative of the De Forest Wireless Company, left Porto Rico several days ago to arrange with the President for the installations.

Consul L. Edwin Dudley reports that two wireless telegraph stations have been established in the vicinity of Vancouver, B. C. One station is situated at North Vancouver, just across Burrard Inlet. The other is at Point Gray, a peninsula, seven or eight miles distant. These stations promise to be of great service to coastwise trade between Vancouver, Puget Sound ports and Alaska.

A serious interruption to transatlantic wireless telegraph service occurred on April 22, when some of the aerial wires at the Glace Bay receiving station of the Marconi Company were broken during a severe storm. The broken wires were at the top of a tall mast over two hundred feet in height. Because of its covering of ice and sleet it was impossible to find anyone who would consent to be hoisted to the top until the subsidence of the storm, and such impedimenta was removed.

A patent, No. 886,302, for a combined tuning coil and condenser, has been granted to Walter W. Massie, of Providence, R. I., assignor to the Massie Wireless Telegraph Company, Providence. In this device there are provided an inductance coil, a condenser having movable plates, a lever for operating these plates to vary the capacity of the condenser, and a substantially circular inductance coil operatively associated with the condenser, approximately concentric with the axis of motion of and engageable by the lever.

A return which has been issued by the marine department at Ottawa, Ont., shows that from April 1, 1906, to March 31, 1907, 20,405 messages were transmitted through the Marconi wireless stations in the Dominion. The amount of tolls collected was $9,033. There are in the Gulf of St. Lawrence and on the Atlantic seaboard thirteen stations. Three are low-power stations and cost $5,000 each. The ten high-power stations cost double that sum. The company, while retaining all the tolls, receives $2,500 and $3,500 for operating the low and high stations, respectively.

Consul Wilbur T. Gracey, Tsingtau, transmits the following information regarding wireless telegraph installations which have recently been placed on the ships of the Hamburg-American Line running between Shanghai, Tsingtau and Tientsin: "Sea telegrams are those which are exchanged between ships at sea and the stations situated on land. They must, when forwarded by way of wireless stations, be either in plain words or in code terms contained in commercial cable codes. If intended for ships at sea, the address must contain, in addition to its usual contents, the name or official number of the ship and its nationality."

President Roosevelt has sent to the Senate the reports of the War and Navy departments and the Department of Commerce and Labor on the international wireless telegraph convention signed at Berlin, November 3, 1906. All three departments recognize the necessity for some rules governing the exchange of aerial messages and approve the convention. The need is urgent, for the reason that there are now in the United States ninety-seven wireless shore stations. Of these forty are operated by the navy, sixteen by the army and forty-one by private concerns. A bill is now under consideration by Congress providing for rigid governmental control of wireless communication, and fixing penalties for private persons who interfere with government messages or indulge in "fake" messages.

Hans Knudsen, a Danish inventor, announces that he has perfected an invention by which he can set type on an ordinary linotype machine in Paris, by wireless waves thrown from London. He further states that he would publicly demonstrate his new invention within a few weeks. We are asked to believe by the inventor that the first machine has proved successful, setting 3,000 words an hour at a distance just as if the operator were working the machine. He even goes so far as to predict that the London correspondents of New York papers would soon be able to send their news straight to the printing press through the wireless operator. Knudsen, in demonstrating his device, sent photographs of King Edward, Queen Alexandra and Emperor William, it is said from one room through the wall into another, without wires, the pictures proving recognizable.

For the last few weeks the French War Office has been experimenting at the Eiffel Tower, Paris, with the system of wireless telephony invented by Lee De Forest, and the success of the experiments and their scope have just been published. Sets of apparatus were installed at the tower, in the Fort of Mont Valérein, and at Villejuif, a southern suburb of Paris. The experiment for telephonic communication between Villejuif and the Eiffel Tower succeeded excellently. Mrs. de Forest, using the apparatus at Villejuif, spoke quite easily to her husband at the Eiffel Tower, more than six miles away. By means of the apparatus at the Eiffel Tower and in Fort Mont Valérein, a conversation was carried on at a distance of three and a half miles with equal ease. The experiments were carried on before several officers of the French army and navy.

The appellate division of the German Patent Office has handed down an interesting decision affecting the future development of radio-teleg-

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raphy and radio-telephony. The decision has reference to the arc-interrupter patent of the Berlin inventor, Ernst Ruhmer, which materially affects the Poulsen system for the propagation of continuous electrical waves. The Amalgamated Radio-Telegraph Company, which is developing the Poulsen system, admits, it is said, that several Poulsen stations are working under the Ruhmer system. The German Poulsen patents relating to electrical radio-telegraphy and telephony and the German Ruhmer patents relating to the electrical arc interrupter have within a few days become the property of the C. Lorenz Actien Gesellschaft, Berlin, which will develop the patents in Germany. This amicable arrangement will prevent the contest between the two inventors, which was feared.

The Marconi Company's Report.

The Marconi Wireless Telegraph Company (England), has only recently made public a report of its condition, brought down to the period ended September 30, 1907. A London electrical journal, whose view is obtained at close range, in commenting upon the statement, had this to say:

"The long looked-for report of the Marconi Wireless Telegraph Company has at length been issued. The unusual delay that has taken place apparently been prompted, firstly, by the complex and delicate situation in which the company found itself when the Government decided to ratify the Radio-Telegraphic Convention, and, secondly, is due to the feeling of the directors that they ought, if possible, to be able to give a definite announcement as to the success of the transatlantic service. The latter has now been in operation for about six months, and thus the directors have had a fair opportunity of judging of the possibilities of the service, though during the greater part of that time the service has been very limited. Little is said as to the actual results that have been obtained, but it is mentioned (on the authority of the newspaper in question) that one newspaper in New York has received dispatches totaling 68,404 words during five months, promptly and efficiently transmitted. When the necessary enlargement and duplication of the machinery has been carried out it is claimed that the stations will be able to cope with a much larger volume of messages, and it is further estimated that the four stations—Poldhu, Clifden, Glace Bay and Cape Cod—working twelve hours a day at a speed of twenty words per minute, and at an average net rate of 4d. per word, will bring in a net revenue, after deducting working expenses, approaching to £150,000 per annum. Nothing is said in the report as to whether this rate of working has hitherto been maintained for any considerable period, though it is stated that the service has been conducted at speeds varying up to twenty words a minute, and that it is expected to attain a speed of thirty words a minute with certain improvements in the apparatus. The estimate, therefore, of twenty words per minute as an average seems optimistic at the present time, not merely from the technical point of view, but also that of obtaining the necessary business turn-over.

"The directors do not look with any greater favor than in the past upon the International Radio-Telegraphic Convention, which they regard as the result of foreign intervention following on their successful efforts in establishing a wireless service at sea; and it is pointed out that the select commttee to which the question of ratification was referred expressed the view that, if the Marconi company was found to be injuriously affected by the ratification, they should be treated with a generous consideration quite irrespective of and without prejudice to their legal position.' The directors have, therefore, been carefully considering the course the company should adopt, and although very little is said as to the outcome of the deliberations, it appears that the board is about to modify its policy 'so as to arrive at arrangements which will not only be satisfactory to the governments concerned, but also remunerative to the Marconi companies.' It is noticeable that the share interests in the subsidiary Marconi enterprises, of the nominal value of £2,394,106. 10s., together with the five hundred and fifty patents owned by the company, are set down in the balance sheet at a value of only £244,966 9s. 6d. But the most important point is that the board will ask the shareholders to approve an issue of 250,000 seven per cent. fixed cumulative preference shares of £1 each, thus increasing the nominal capital to £750,000. This is a sting in the tail of the report which will not be comforting to the existing shareholders. These new preference shares will be entitled to dividend in priority to all other shares, and subject to the payment of a non-cumulative dividend of ten per cent. per annum on the paid-up ordinary share capital of the company, they will have the right to participate, *pari passu*, in proportion to the capital paid up, with the ordinary shares of the company in any profits not required for the payment of such preferential dividend. Except so far as this new capital, should it be obtained, may serve to improve the general position of the company, it is clear that the present shareholders have little prospect of any return upon their investment. Further, a large part of the new issue will be required to pay off the company's existing financial engagements, so that, after meeting such liabilities and the cost of issuing, it will not provide any very considerable working capital for expansion. Finally, the mystery of Mr. Cuthbert Hall is referred to at the end of the report, but is not cleared up. The net result, however, is that he has relinquished his position as managing director, together with any claims for commission, in consideration of a payment in cash and the allotment to him of 10,000 fully-paid ordinary shares in the company. Mr. Cuthbert Hall has since retired from the board, and we conclude that a new era in the policy of the Marconi companies has begun."

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The Cable.

The new submarine cable between the Cocos Islands and Java is open for traffic.

Cable communication is interrupted May 13 with:

Venezuela	Jan. 12, 1906.
Hayti	Jan. 18, 1908.
All offices closed to International traffic except Cape Hayti, Mole St. Nicholas and Port au Prince.	
Madura Island (Dutch East Indies)	Feb. 3, 1908.

Mr. Herbert Taylor, acting superintendent of the Commercial Pacific Cable Company at Guam, where he has been located for the past five years, is now in New York on a vacation which will be extended over five months. After making a visit to Manchester, England, his old home, he will return to Guam. Although, of course, the island is an isolated spot on the map of the world, Mr. Taylor appears to enjoy life there, and is enthusiastic over its climate, which he describes as being well nigh perfect.

The Department of Commerce and Labor has been advised by cablegram from Special Agent Roland R. Dennis, who is in attendance as representative of the United States government upon the International Telegraph Conference, now in session at Lisbon, containing important information that business interests are not to be disturbed by a serious curtailment of the right to use codes in international cabling. The cablegram reads as follows: "Tone of the Conference is not strongly antagonistic to the large majority of existing code regulations. There is a feeling to prevent the use of unpronounceable combinations of letters now being supplied by codemakers. The British Post Office circular issued to Chambers of Commerce reads in part: 'The Postmaster-General thinks it desirable that the condition as to pronounceability be somewhat more clearly defined in order to put some limit for the future to a growing tendency which, if unchecked, cannot fail to produce results highly injurious to the telegraph service generally, and therefore to the public and to commerce.'" There is, however, no intention of adopting other than a wide and even generous interpretation which would cover the bulk of the codes at present in use.

The Telegraph Conference and Pronounceable Words.

The English Postmaster General has made a statement on the subject of the possible adoption of restrictive regulations with regard to code telegrams by the International Telegraph Conference, which assembled at Lisbon, Portugal, on the 4th inst. He points out that the privilege of using artificial "pronounceable" words on the footing of code at ten letters to the word was granted on the assumption that it would not be abused; but, unfortunately, many words had been submitted, such as BYWRGROCBX, which could hardly be said to be pronounceable. A telegrapher could deal more rapidly and surely with a pronounceable word, which he could grasp and remember while transmitting, than with an arbitrary combination of letters, each of which required a separate effort of attention. He, therefore, thought it desirable that the condition as to pronounceability should be more clearly defined, in order to check this growing tendency, without, however, adopting an ungenerous interpretation of the condition.

Obituary.

Howard J. Bruce, aged forty-seven years, a Western Union telegraph operator at Richmond, Va., died in that city on April 18.

John T. Brophil, forty-four years of age, a telegraph operator, formerly well known in race-track reporting, died at St. Louis, April 7.

Charles G. Pond, aged fifty-five years, a member of the operating force of the Western Union Telegraph Company at Boston, died April 23.

An American telegrapher named Chablin was killed by the insurgents in Peru, on May 6, previous to the attack made by them on Cerro Pasco.

Joseph Crawford, aged forty years, a Postal telegraph operator at Pittsburg, Pa., committed suicide at that place on April 8. His home was in Philadelphia.

Charles H. Seiffert, a well-known operator in both commercial and railroad telegraph circles in Chicago, Memphis, New Orleans and Cairo, died at Moline, Ill., after a prolonged illness, on May 2.

John W. Mannion, aged forty-four years, a telegrapher connected with the Western Union Telegraph Company at Pittsburg, died at his home in Newark, O., on April 5. From 1888 to 1903 he was manager of the Western Union office at Newark.

Frederick H. May, aged eighty-three years, and who was vice-president and general manager of the American Rapid Telegraph Company during the existence of that concern, died, May 10, at his home in Newark, N. J. He had been prominent in railroad construction in the West and Middle West in the seventies, and won fame in the Civil War by keeping the Illinois Central north of Cairo open for troops and supply trains for General Grant. Mr. May was born on the Isle of Man. He had lived in retirement for many years past.

John F. Martin, aged fifty-six years, a former telegrapher, but for the past twenty years a stock broker in New York, died April 25. Mr. Martin was a native of New York City, and became a clerk in the Western Union cable office in 1870. He subsequently learned telegraphy and was an operator in the main office of that company until 1888, when he resigned to become a member of the Consolidated Stock Exchange. A few years later he became a member of the New York Stock Exchange, with which he continued to be identified up to the time of his death.

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W. J. Murphy, aged fifty-nine years, vice-president of the Cincinnati, New Orleans and Texas (Queen and Crescent) Railroad, died, May 10, at Cincinnati. He began his career as a messenger boy in the service of the Erie Railroad, afterwards becoming a telegraph operator, despatcher, chief despatcher, superintendent and general superintendent. He resigned from the Erie in 1888, and after a short vacation became superintendent of the Eastern Tennessee, Virginia and Georgia Railroad, now a part of the Southern. From that road he went to the Queen and Crescent, and served it first as superintendent, and later as general manager. Five years ago he was made first vice-president. Mr. Murphy kept up an identity with telegraph interests by retaining his membership in the Old-Time Telegraphers' and Historical Association.

Governor Hughes Recommends State Supervision of the Telegraph.

Governor Hughes, of New York, in his message to the extra session of the legislature, convened May 11, had this to say in recommending the placing of the telegraph and telephone under the control of the Public Service Commission:

"The amendment of the Public Service commissions law by making suitable provision for the enlargement of the jurisdiction of the Public Service commissions, so as to bring telephone and telegraph companies under proper regulations, and also such other amendments of the statutes as may be deemed advisable in the light of the experience of the commissions, in order more fully to accomplish the purpose of the Public Service commissions law.

The policy of the state with regard to the supervision of public service corporations should be uniform and embrace all corporations of this character. Telephone and telegraph companies exercise important public franchises. The community should be protected against extortionate rates and machinery should be provided for an adequate supervision of operations and service. Issues of securities should be made only under appropriate public scrutiny, to prevent the evils of unwarrantable inflation. The state should protect its citizens from exploitation on the part of those who enjoy public privileges and undertake public service, while at the same time, by provision for thorough investigation and the careful examination of facts by an administrative board suitably equipped for this purpose, the evils of ill-considered and arbitrary action before the facts have been properly ascertained should be avoided. Justice to the community does not involve injustice to private rights. The provision of adequate means for the exercise of the state's authority of regulation, so as to insure the performance of public obligations in a just and impartial manner, is of the highest importance to the good order of the community and to the welfare of all the people. The state cannot afford to be lax in the exercise of its supervisory powers, but they should not be exercised without due regard to the varying problems of numerous particular cases. The subjects of complaint in connection with the operations of public service corporations involve so many considerations, and demand such patient, expert and thorough inquiry that they cannot be dealt with to advantage through sporadic legislative action.

The plan which was adopted last year of establishing public service commissions has worked admirably, and, indeed, as an adequate scheme of regulation presents the only alternative to legislative action, which is manifestly not as well adapted to the just settlement of the great variety of grievances which must be dealt with separately and after investigation and are susceptible of a fair disposition only through a continuous administrative board. The plan should be made comprehensive; and now that the commissions have been organized and are in working order, it is proper that telephone and telegraph companies should be brought under their supervision. This may be made effective as early as October 1, 1908. Action now will save, at all events, many months, and, most probably, a year's delay in establishing this important jurisdiction.

Operators Who Have Been Successful.

Reading an article a few days ago, reprinted in the New York Herald, in 1891, from a Philadelphia journal, regarding the telegraph and its operating force of that day and generation, Mr. D. H. Bates, one of a group of gentlemen, was stirred to reminiscent review. Recalling the names of some former operators of the Quaker City, who in other fields of endeavor have since won for themselves place, recognition and substantial reward in the good things of life, and who when in the service were conceded to have had excellent all-around abilities as operators, excelling perhaps as senders, Mr. Bates, said:

"There were at this time some fine senders in Philadelphia, prominent among them being Robert J. Wynne, afterwards Postmaster-General and now United States Consul-General at London; P. Voorhees Degraw, now Fourth Assistant Postmaster-General; John A. Henneberry, now chief clerk in District-Attorney Jerome's office, New York, and E. C. Boileau, now with a Philadelphia broker. Here at New York, 'Wal' Leaming was my admiration; 'Ham' Young's sending was like copper-plate—never a break. Then, as now, he was located in Washington, where for years he has been the night manager of the Western Union office. Then there was John E. Zueblin, who was killed a few years ago when passing from one car to another on a train in Ohio—his Morse was fine, but his spacing was not so good. Fred. Catlin, who is still in harness, and who lives over in Brooklyn, was always a superb operator. How many there were! What an impressive list of names might be enumerated. Alas! where are they all now?"

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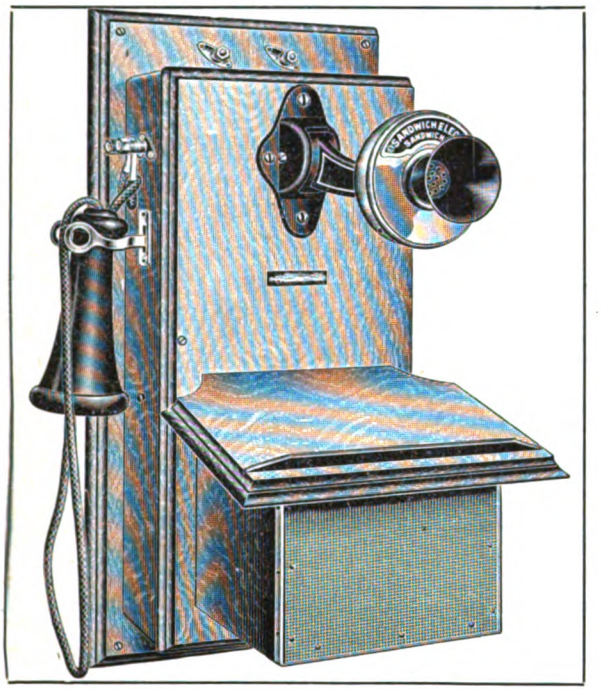
Railway Composite Apparatus



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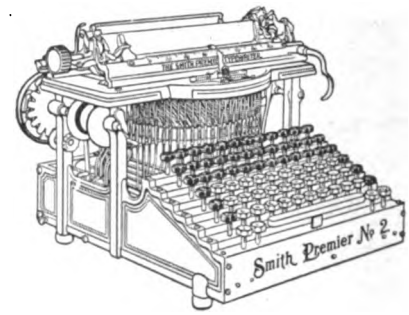

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NEW YORK, MAY 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The Telegraph Bills in Congress.

The declaration made by George H. Fearons, general attorney of the Western Union Telegraph Company, before the House Committee on Interstate and Foreign Commerce, on May 5, conveys information of profound significance as to the character and relative percentage of the messages transmitted by telegraph in this country. Mr. Fearons appeared in opposition to a bill introduced in the House by William J. Cary, of Wisconsin, requiring telegraph companies to transmit with all telegrams sent the time of their filing. Mr. Fearons said that sixty per cent. of the telegraph messages of the country consisted of the transmission of business despatches, those emanating from exchanges, boards of trade, merchants, etc.; twenty per cent. might be credited to press matter, fifteen per cent. to railroad needs, and of the remainder, three per cent. to the sending of private and social communications. The exceedingly small number attributed to the latter, as an originating source, will doubtless be a surprise to many. Yet the figures named are no doubt substantially correct. Society, considered as a concrete proposition, contributes but a moiety to the support of the telegraph. It is clearly evident that the business interests sustain and are responsible for its well being. Without such maintenance the passing of the telegraph would be inevitable. Although criticism of the telegraph more frequently arise from within social circles than from any other source, the insignificance of its needs and consequent demands, as compared with the whole, is but as a drop in the bucket.

In stating the company's objections to placing the time of filing on each telegram sent, Mr. Fearons pointed out the hardships that would follow the operation of such a law, holding that its enactment would impose a grievous burden in the conduct of a business so vast in extent as that of the Western Union Telegraph Company. He said that on the basis of 74,805,000 telegrams, the number transmitted annually by his company, the additional words required for expressing the filing time would reach the enormous equivalent of 17,454,000 messages of ten words each. Such a statement made in answer to the carelessly considered proposition embodied in the demands that the passage of the House bill would enforce, is well calculated to arouse and hold close attention and cause careful deliberation of the subject involved on the part of the committee in whose hands the bill now rests.

No more deplorable spectacle has ever been witnessed in the annals of the telegraph than the effort now being made by a certain class of telegraphers to influence national legislation in a manner antagonistic to the telegraph interests of this country. The hearings that have been held by both the Senate and House committees of interstate commerce, to enable those who are responsible for the bills regulatory of the telegraph, to appear in their behalf, have not proved to be altogether enlightening exhibitions of high-minded and disinterested purpose. It may be considered questionable, indeed, whether the gentlemen constituting the committees have been sufficiently influenced by what the hearings have developed, to regard the passing of the bills as desirable. We hazard the opinion, based upon the equities dictated by common sense, that it will be a long time before the telegraph bills now in committee hands of both branches of Congress will be reported upon. The telegraphers have rather overacted their part in appearing in such a highly moral attitude of mind in an attempt to force coercive legislation upon the telegraph. Indeed, to a close observer the vision of a little halo might almost have been discovered gathering about the brows of the officials of the Commercial Telegraphers' Union, assembled before the committee, when it was

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declared that the true intent of the bills which they advocated had "but one object in view and that was better service," each spokesman declaring in turn that the welfare of the dear public was the impulse that stirred his heart. Of course, all thought of vindictiveness of motive as exercising any influence in the proceedings is out of the question!

"The Importance of Legible Copy."

How relevant the question of the production of legible copy is deemed in the telegraph service has received abundant illustration since the appearance of the editorial in Telegraph Age on May 1, entitled "The Importance of Legible Copy." The article evidently struck a sympathetic chord in the managerial mind in general, for a number of letters have since reached us, not only expressive of approval, but also entering into a discussion of the "lost art," as one writer termed it. Commenting on the subject, W. C. Black, superintendent of the Postal Telegraph-Cable Company at Denver, Colo., wrote: "I believe the operators of to-day would exercise greater care in producing in neat form, and in transcribing messages correctly on the typewriter, could they but inspect some of the messages that were written with the pen by operators back in the seventies and early eighties. I have in my possession a number of such, and enclose for your inspection a few sheets of press report, made by George J. Carroll, of Detroit, and Mr. Kronenberg, of Toledo. Copy of this character was typical of much that was regularly produced in those days by numerous operators. It delighted the printer. I wish it might be produced in fac-simile to show the modern operator a style that was common in the old days. I recall with satisfaction many of these former 'masterpieces' that would do credit in their beauty of style and of their perfect legibility to a teacher of penmanship. New York, Chicago, New Orleans, Omaha and, in fact, all large cities, had elegant penmen among the operators in the time to which I refer. For my part, I would like to see some of the 'copy' made by such men as Barney De Kline, 'Bob' Cuppage, 'Jack' McRobie, 'Bob' Rattray, 'Jimmie' Largay and W. J. Quinn. We should be getting back to gracious and graceful first principles."

The Post Office Electrical Engineers' Journal.

"The Post Office Electrical Engineers' Journal" is the title of an English quarterly, of magazine form, the initial number of which was issued in April in London. It is the official journal of the institution whose title it bears, and in that capacity it stands representative of the telegraph and the telephone in Great Britain, the former of which in that country is under Government ownership, while the latter is rapidly passing under such jurisdiction. This first number which reaches us, and which gives abundant promise of being representative in the best sense of the subjects which it aims to discuss, contains a number of excellent articles of a character which should commend the publication to the best practical and scientific thought of the professions indicated in the British islands. An engraving of Sir John Gavey, C. B., the first president, in 1905, of the Institution of Post Office Electrical Engineers, and who was formerly at the head of the English telegraphs, offers an attractive frontispiece to the journal. He also contributes a signed article entitled "Words of Welcome." Donald Murray has an article on the "Typewriter and Piecework in Telegraphy," in which he depicts the use of the typewriter by operators in America. There is also published an amount of social miscellany appealing to local interests. It appears by an accompanying circular, that a number of articles are in preparation for future publication, to be contributed by well-known writers, one by Sir Wm. H. Preece, K.C.B., being on "Pre-Post Office Telegraphs." The current issue contains eighty pages. The publishers are H. Alabaster, Gatehouse and Company, London, the price of subscription being four shillings.

Filing Time on Messages in Georgia.

The railroad commission of Georgia has passed a rule amending a former rule requiring telegraph companies to show the time both of filing and delivery of messages, by which the telegraph companies are allowed to charge two cents additional for all over ten words when the time of filing is shown.

The order is rule 3, and is as follows:

"Telegraph companies are required to show on each telegram they transmit and deliver between points in Georgia the correct time, expressed in hours and minutes, that such telegram was received at office of delivery. And where the sender of any such message desires to show also the correct time of filing with initial office, the transmitting company shall, where the words necessary to express the filing time added to the words in the body of the message do not exceed ten words, carry said information free. But where such words added to the words in the body of the message exceed ten words a charge of two cents per word for each word in excess of ten shall be allowed, subject to a maximum extra charge for showing said time of filing of five cents."

Maryland has enacted a law by which the telegraph companies are obliged to place the hour of filing on all messages.

The Telegraph in Austria.

At the end of 1906 the Austrian telegraph system aggregated 37,966 kilometers of State lines: 4,851 kilometers of railway, and 100 of private line, or a total of 42,918 kilometers. The total wire mileage of the three systems was 145,794, 68,828 and 323 kilometers, respectively, or a grand total of 214,945 kilometers. The system of State lines and wire increased during the year by 674 and 4,290 kilometers, respectively, that of the railways

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by 14 and 1,571 kilometers, while the figures for the private systems were 100 and 322 kilometers. The wires are chiefly composed of iron. There were in Austria 6,409 offices open to the public, being an increase of 104 on the previous year; 4,026 were Government, and 2,360 railway offices. The number of offices represents one for every 46.8 square kilometers, and 4,080 inhabitants. A pneumatic system is working between Vienna, Prague and Carlsbad, the length being about 81 kilometers.

Mr. Vail Has No Objection to Public Control.

Theodore N. Vail, president of the American Telephone and Telegraph Company, in his recent annual report, presents an interesting analysis of the telephone business. Among other things he says:

"Any revenue produced over and above legitimate requirements and the proper reserve to provide for contingencies could be used for the benefit of the public, allowing the company to retain a part sufficient to stimulate the most efficient and economical management. It would be difficult, if not impossible, to get effective and economical management, such as would produce the best results for both public and the shareholders, without recognizing this principle."

Also that "it is contended that if there is to be no competition there should be public control. It is not believed that there is any serious objection to such control, provided it is independent, intelligent, considerate, thorough and just, recognizing, as does the Interstate Commerce Commission in its report recently issued, that capital is entitled to its fair return, and good management or enterprise to its reward."

Poulsen on Wireless Telephony.

Prof. Valdemar Poulsen, the Danish inventor, read a paper before the Royal Institution in London recently on his system of wireless telephony, remarks the Electrical World. After detailing how he had succeeded in carrying the human voice through the air a distance of about two hundred miles, that is to say, between Copenhagen and Berlin, Mr. Poulsen is reported to have spoken as follows:

"The essence of my discovery is its simplicity, and it resulted from another discovery I made several years ago that the rapid passage of electricity to and fro produces an effect known as the 'singing air.' This singing I found produced notes too low for the air to hear and some that were too high to be understood, so in order to make the notes understandable I arranged an apparatus consisting of coils of wire, joined in series to a condenser with leads to the source of the current, joined by two carbons in parallel.

"I found that the current flowed rapidly in the arc between the carbons, oscillating to and fro, and the oscillation was enormously improved by occupying the intervals between the carbons with hydrogen gas. This resulted in continuous undamped waves which can easily be tuned to any desired plan, so that they will only influence those instruments which are arranged to correspond with the sending instrument."

Coming to the pure telephone and efforts to establish wireless communication, Mr. Poulsen said that the waves that Bell had harnessed by the use of mirrors had proved to be without value, but with the undamped waves, each exactly like its predecessors, the problem had been solved. These regular waves transmitted sound perfectly, and by means of them it had been possible to telephone a tune, without wires, two hundred and ninety miles, and to make a human voice recognizable at a receiving station one hundred and seventy miles away from the person speaking. At the close of the paper some interesting demonstrations of the new method of communication were given.

An Australian Telegraph Invention.

Mr. William Leivesley, a postmaster in Queensland, has just patented all over the world a telegraphic invention of considerable interest. According to a foreign authority "the object of the invention is to provide circuits and a simple combination of apparatus and switching gear to facilitate the transmission of messages direct to their destinations, over long lines in a variety of directions, to a greater extent than has hitherto obtained; to permit any prearranged number of telegraph circuits to work with each other just as though they were one and the same circuit; to enable a number of stations on different lines, not ordinarily in direct communication, to communicate directly with each other without hand repetition. Hand repetition, and the delay, labor, and the possibility of mistakes incidental thereto, are also obviated or greatly reduced when an interruption on a line occurs. In newspaper messages the same news may be transmitted direct to its various destinations by one telegrapher by one operation of a telegraph key. The lines are relieved of the time taken up in receiving and transmitting at intermediate stations. The invention also allows of signaling four or more ways on the Morse system, and at the same time may embrace or combine other systems. It provides for repeating direct on to main lines, and different systems are also enabled to work together and interchange signals harmoniously. The great economy in the "diversifier" system is that the old systems, machinery and equipments of circuits, may be adopted to the diversifier in the internal wiring of offices and joining to the switchboard."

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$1.50 a year.

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For "The Honor of the College."

BY DR. L. M. RHEEM, OF MINNEAPOLIS.

Your editorial, "Thoughts for Reflection Affecting the Telegraph Service," in TELEGRAPH AGE of April 16, was read by me with the deepest interest. The article is true and timely. A man with no axe to grind can sometimes say things in a way that gives them weight with those to whom they are directed, which he could not do were he on one side or the other in the controversy.

While I may be classed as a "rank outsider," having no right to "butt in," I believe it to be my plain duty, as well as the duty of other men occupying a like position, to say a word on the subject of your editorial. I regard myself as a member of the telegraph alumni, and look upon the telegraph as my alma mater, for the reason that it was in that service that I first acquired a knowledge of the basic principles of all business, saw the necessity of an education, and had aroused in me, by the precept and example of the educated gentlemen then constituting the very large majority of the rank and file, an ambition to be able to do my future work for the work's sake, instead of for the sake of a job.

In this respect I am neither a prodigy nor a curiosity, for in less than ten minutes time one can call the names of more than a hundred men occupying positions of honor in all the professions, conducting or controling large business interests in all activities of the age, and entrusted with the administration of affairs on which the destinies of the governments of the world depend, who received their first training in the same school.

While I have not gone as far as some of these gentlemen have in the accumulation of the goods of this world, I look on their preferment with no feelings of envy; rather am I proud of them, proud to be even in a small measure in their class, and proud of the telegraph through which they were given to the world.

Their very existence and the history of their achievements should be an inspiration to better things for every employe of the telegraph, and should be made one of the prime factors in the abolishment of the labor union, which, in my judgment, has no place in the profession.

I don't know who the misguided individual was who gave us the nonsensical jingle "In union there is strength," nor whether he intended it to apply to all kinds of unions; if he did, it has been conclusively demonstrated by the three telegraph strikes that "In union there is not strength."

When I see one of these elaborately designed affairs with signs, passwords, grand this, or grand that, walking delegates, organizers, or what not, as well as an elaborate ritual for the "initiation" of dissatisfied, incompetent workers, I feel like saying, "Boys, forget it! That craft goes to the Port of Nowhere, and it never arrives; in a short time it is a water-logged derelict, menacing and destroying the property of the honest skippers on the ocean of commerce."

I never like to hear a man criticise anything unless he has something better to take its place. Well, I have something better to offer; and if you want to know what it is I will tell you. The prescription has been tried a thousand million times, and it has cured every time.

Before prescribing for the ailment of a patient, it is necessary to make a diagnosis. That is an old Greek word, and it means "I know." To diagnose the case before us, we require the services of no expert diagnostician; a tyro can see that the malady is Ignorance and Pessimism. Either of these alone is bad enough, but together they are very serious. Both embody the destructive principle. Ignorance comes from the old Latin "Ignoramus," meaning "we know not;" pessimism comes from the Latin "Pessimus," meaning "the worst," and "Pestis," meaning "an infectious disease."

They belong to the shadows and the darkness, to the bludgeoner and the assassin; they have no place in the light of the present day. Neither of them ever built anything, not even a chicken-coop. They never have made, and never will, make an honest dollar for any man.

In all the pages of the history of the world, no good act is recorded as having been performed by ignorance or pessimism. They sent Jesus of Nazareth to the cross, and Jacques de Molay to the stake. They have consistently obstructed the advancement of the seven liberal arts and sciences, have throttled invention, destroyed governments, leaving chaos, ruin and misery in their wake.

For an illustration, we need go no further than our own Morse, the fruit of whose inventive genius was made the butt of the so-called congressional wits, ignoramuses in disguise. The first message of the telegraph, "What hath God wrought," should be the key-note in the action of the telegraphers of to-day; "What hath God wrought," an illumination of the creative principle, a typification of the builder. Ignorance and Pessimism can not, and should not be permitted to travel in such grand company.

No, boys, this thing will not do; you have had given in your charge the traditions of one of the noblest professions in the world, a profession whose fundamentals carry one straight into the very heart of the universe; a profession through whose hands passes the expression of every emotion of the human mind, and which occupies the position, in a large measure, of conservator of the destinies of the human race. The "honor of the college" has been entrusted to you and you must keep it untarnished.

What? "You don't get enough salary?" That has nothing to do with the question. I am not talking of telegraph companies, I am talking about the Profession of the Telegraph. Just you forget your miserable, petty squabbles with those companies, get yourselves in condition and in line for

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better things, and the salary question will be solved before you realize it.

"How can you do it?" I'll tell you. Get rid of your ignorance as quickly as you can and uproot that pessimism even to the faintest little rootlet. To illustrate how you may do this I will tell you a story.

In the early seventies, I knew a telegraph office in which there were eighteen or twenty operators employed, the business handled by it was intricate and required skill of a high order. A large amount of the business was code cables and messages, in which a large number of words were used whose meanings were unknown to the operators handling them. Now, while they could handle these messages without knowing the meaning of the words in them, they "wanted to know," so they chipped in and bought a Webster's Unabridged Dictionary. Thereafter, when a new word made its appearance, it was quickly memorized and given a place in the educational equipment of the ambitious boys who simply "wanted to know." As is the case with every one who wants to know, these boys were not satisfied with this knowledge alone. The Franco-Prussian war was then in progress; in the press news of each day from the seat of war, new towns and cities were mentioned as the different armies moved, as well as the names of new generals on both sides.

The boys chipped in again and bought a large atlas and an encyclopedia, for the purpose of securing full information of these places and men. By the time the war was over, the boys not only knew exactly where the places were located, but knew all about their principal industries, how many persons they employed and where they sold their products. They not only knew who the different generals were, but how they came to be generals; they not only knew the generals, but their relatives, where they lived and what they did for a living. If a message had been handed to one of those boys with instructions to deliver it to either Bismarck, von Moltke, Bourbaki or Bazaine, it would have been delivered without asking a question, for he would have known exactly where to find the gentleman in the shortest possible time.

Well, what came of this? One of the boys became, on account of his general knowledge of things, private secretary to the Secretary of War, studied law, and, before he died, made a place for himself of which he had reason to be proud. The very first piece of legal business he did, was to draw my "last will and testament" for me, just to see, as he said, "whether he could draw a will that would stick." I still have the will; and whenever I look at its beautiful chirography, its carefulness of detail and its correct legal phraseology, I think with affection of the genial kindly gentleman whose first training was received in the "College of the Telegraph." Others of this company reached distinction as writers, authors and business men, and those of them who are alive to-day still "want to know."

While the class of knowledge here outlined is useful as a preparation for business apart from the work of the telegraph, you should not stop with that; in fact, you should begin by learning what you don't know about the telegraph business. See how many things in the following list you don't know, and then make it your first business to learn them:

How to receive a message at the counter; find the tariff and check it properly; how to make up a money order; how to account for a message; how to make up the different reports of an office; how to get the message to the operating room; how to route it; how to classify it for transmission; how to transmit it in the most workmanlike way; how to prepare it for delivery; how to deliver it; how to place a message on a receiving blank so that it "balances" the blank and impresses its addressee with its clean-cut arrangement. I have two typewritten messages before me now, received in the last few days, which an operator should not allow to go out; their make-up is slovenly, spacing irregular, capitalization disregarded, and a general air of carelessness and "don't care" about them that makes me wonder whether they are really correct. These things, you will say, are too simple to bother with, and belong to the managerial and accounting departments. Well, don't you want to be a manager some time? Or would you rather be the "ice man," with just enough knowledge to crack off a chunk, flip it across the lawn and yell "I-c-e?"

To go still further—see if you know how to set up a simplex, duplex, quadruplex, printer, ticker, Wheatstone, Barclay, or Rowland; how to install and manage a dynamo plant; how to test wires; how to find and kill a "bug;" how many wires enter the switch boards of the office; how many follow different routes; where the testing stations are; how to "patch" a wire and how to handle the different wires in the most economical way.

How will you learn all this? It is easy enough. The first time you have an hour to spare, instead of wasting it in bewailing your condition and criticising your employers, drop in to see the manager; tell him that you would like to acquire a knowledge of bookkeeping and reporting of the office and ask him if he cannot give you a chance to do so. He will likely tell you that he cannot increase his expense in that department, as it has already been criticized by his superintendent. Tell him to forget it, that there will be no expense about it, that you just want to learn how to do it, and are willing to work your way.

Now, the manager may faint, or he may discharge you on the spot; at any rate he will grant your request in the end and will keep you in mind. The chances are that the first time he gets confidential with his superintendent he will tell him "what a funny thing" happened the other day when Brown came in and wanted a chance to learn

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about the accounts of the office. It will tickle the superintendent, and he will keep his eye on you, and one of these days when he wants a manager in a hurry you are quite likely to be "it."

Then, after you have trimmed up the manager, go after the chief operator or division chief; tell him that you would like to know how to handle your own quad and duplex sets; that you have noticed that a good deal of time is wasted each day in waiting for him to come and balance the set; tell him you would like to do a little extra work for nothing in learning the switchboard and testing; offer to borrow some books from him; tell him you "just want to know." Read the regular article in TELEGRAPH AGE, entitled "Some Points on Electricity," in which Willis H. Jones is endeavoring in a careful, painstaking way to show you the road to salvation.

About the time you have finished these stunts will be the time for you to break into the superintendent's office, if you are at district headquarters; strike the chief clerk and tell him you have heard of a "semi-annual" that he makes up; tell him you would like to come around and help out on it if you could, just to know what it is; get acquainted with that wild-eyed estimate clerk, who is a walking wonder of maps, poles, wires, crossarms, cables, conduits, manholes, cost and methods of construction; tell him the same thing, that "you want to know." Now, don't you worry about these men not being willing to tell you what they know; they will do it all right, for the reason that they have been waiting a long time for a man who wanted to know and would listen and learn.

Then go around to the office of the superintendent of construction; he knows a lot of things that you should know; they are all interesting and useful. He is usually a little crusty from having come in contact with so many farmers having original ideas on rights of way across their fields, but if you convince him that you want to know, he will tell you all about it. In going through this "freshman" term, you will see a great many side lanes and by-paths that are full of various kinds of knowledge; you cannot stop to explore them all, but you can make a note of them and go back some day when you get around to it.

Now, let us suppose that you have hived all this knowledge, and have not been promoted—have not even had your pay raised. That would appear as though there were some flaw in the scheme, would it not? Not at all; you were not doing this for a salary; you were doing it because you "wanted to know;" now that you do know you can make Mr. Ignorance look pretty foolish when he goes round telling people that he still lives in your house; he is "on the block" and he does not know it.

Well, I will tell you what to do next; take a vacation. That is, dress up pretty spruce and take a walk through the business district; watch for the names of firms and individual whom you have noticed as sending a very few messages or no messages at all by your company; make it your business to get acquainted with the manager of the concern, and go after him for business for your company. Don't be afraid of him; he looks pretty fierce, but you are just as good a man as he is, and you know a whole lot of things that he does not know. He will likely tell you a story of hard luck he experienced through your company, and that he would not send a message with that set of robbers under any circumstances. You tell him that the things he tells you are some of the very things that have been corrected; tell him you want him to try it again; that you work the wire that would handle his business and that you will give it the very closest attention; tell him that you want his business because it will help you more than it does the company; make it a personal matter with him, and don't let it rest with one call; keep after him. Then tell the manager of your office that you have been talking to a friend of yours about giving the company his business, and that he is going to do it. Follow this line of work through this "vacation," and note the result.

One of three things is bound to happen — you will either have your salary raised, be promoted to a more responsible position, or one of those clean-shaven, clear-eyed, hustling business men will say to you: "Say, young man, I want you to go to work for me. You have the qualities I need in my business." I do not know whether your old company would let you go or not; if it did, it would part with you with the kindliest feelings, and you could go back to it any time you wished to.

I do not know what the policy of the presidents and general managers would be in relation to a man or set of men who would really work for the company, but judging from the way they have taken care of the large number of men who have worked in this identical way, I believe their policies would be satisfactory to all concerned. I have some old-time friends perilously near the top of the telegraph ladder, and every time I see one of them negotiate an additional rung it makes me feel good, for I know that they are keeping the old traditions and the "honor of the college."

Boys, try it; get in line; play ball.

Somewhere about the time indicated a few paragraphs back, you will make a queer discovery; you will remember that you started to get rid of Ignorance and Pessimism, and that by just helping other people you have lost them both; and in their places you have installed Knowledge, Enthusiasm and Fidelity—a grand trinity.

Do you know what enthusiasm means? It is from the two Greek words "en" and "theos," and it means "I have a God within me." Fidelity comes from the Latin word "fidelitas," and it means "Faith," the first of the magnificent triumvirate that rules the world, and who brings in her train her two beautiful sisters, Hope and Charity.

What a pitiful thing a man without Faith is!

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With no faith in the future, with no faith in his fellowmen, he has no faith in himself, no ideals, no visions; he has no conception of his place in the grand scheme of the universe, and his worth cannot be indicated by the cipher, which is the pythagorean symbol of infinity and eternity.

What a monstrosity a man without Hope is! Groping in the shadows and the darkness, with his face turned to the depths, he hears no message from the empyrean, calling him to the better life.

And a man without Charity!

Though I speak with the tongues of men and of angels, and have not charity, I am become as sounding brass or a tinkling cymbal.

And though I have the gift of prophecy, and understand all mysteries, and all knowledge; and though I have all faith, so that I could remove mountains, and have not charity, I am nothing.

* * * *

Charity suffereth long and is kind; charity envieth not; charity vaunteth not itself; is not puffed up.

Doth not behave itself unseemly, seeketh not her own, is not easily provoked, thinketh no evil.

* * * *

Beareth all things, believeth all things, hopeth all things, endureth all things.

Charity never faileth; but whether there be prophecies, they shall fail; whether there be tongues, they shall cease; whether there be knowledge, it shall vanish away.

* * * *

When I was a child, I spake as a child, I understood as a child, I thought as a child; but when I became a man I put away childish things.

For now we see through a glass, darkly; but then face to face; now I know in part, but then shall I know even as also I am known.

And now abideth faith, hope, charity, these three; but the greatest of these is charity.

Boys, you cannot change by one jot or tittle, the philosophy of the ages; it was given to us at the dawn of creation; its precepts and messages have been repeated to us by Moses, Solomon, Jesus of Nazareth, Confucius, Buddah and Mahomet, whose followers in all parts of the world are trying, each in his own way, to see the light and bring the brotherhood of man.

In this indescribably wonderful century, these precepts are being amalgamated with and utilized by the thinkers and planners of the business world; it may be said for a selfish reason; this may be true at the start, but even the practice of them in the pure abstract will soon bring the full melody that comes from the soul.

There is a legal fiction saying that "a corporation has no soul." This has been quoted freely of telegraph corporations, but it is the purest fiction. These corporations each have a soul; a great big virile soul, because it is made up of the souls of the splendid men who have the direction of the corporations' affairs. But, they also have "a charge to keep;" that, in its last analysis, is a sacred one; a part of it is "The traditions of the telegraph and the honor of the college."

Will you help them keep this charge? If you will, you will soon find and realize their souls. If you will not, but still insist on "sowing the wind," blame no one but yourselves when you reap the "whirlwind."

Now, I should like to know whether I am alone in my way of thinking? I should like to know whether I am a dreamer, a visionary, and "seeing things?" I should like to know how other members of the "alumni" feel about this question? I know of a number on whom I could call and whose names I could give, but I am going to call only upon two, although in so doing I am taking an unwarranted liberty, as I have never met either of them and am totally unknown to both. But their faces, as they have appeared in the public prints, are familiar to me as well as to all; their splendid careers starting from the common walks of life, through the "College of the Telegraph," through their magnificent benefactions and works for the benefit of civilizations and of their fellow men, have been an inspiration to me as well as to others. You know their names even before I write them. Will Mr. Andrew Carnegie and Mr. Thomas A. Edison from their rich experiences of the past, their knowledge of the present and the innate kindness of their hearts, take a few minutes time to tell these boys whether I am right or wrong in asking them, in begging them to fit themselves to keep and preserve "The traditions of the telegraph and the honor of the college?"

Municipal Electricians.

Patent No. 451,902, for a fire-alarm telegraph apparatus, held by J. W. Stover, of Newtonville, Mass., has expired.

William S. Riehl has been appointed superintendent of the fire alarm telegraph service of Cincinnati, O., to succeed his father, the late Louis F. Riehl, who held the position for many years. The salary is $2,000 a year.

A patent, No. 884,607, for a telephone fire alarm, has been granted to William S. McLewee, of Yardley, Pa. Diagram of circuits adapted to telephone subscribers in order to give a fire-alarm signal over usual telephone circuits.

Once more the fire-alarm system in New York City has been severely condemned. Superintendent Martin, wire chief of the fire department, at a hearing before the Commissioners of Accounts on April 30, stated that the whole alarm system below Fifty-ninth street was likely to be rendered useless at any moment. Mr. Martin described the working of the system, its inauguration, and its history. He also explained how the system had been added to from time to time as the city's fire limits extended. He called attention to the fact that the system had never been designed for a city of New York's magnitude. The condition of the trunk lines below Fifty-ninth street, he said, was especially bad, particularly in and around police and fire headquarters.

This is a good time to begin a subscription to Telegraph Age, $1.50 a year.

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Some Suggestions From the "Call Boy."

A writer in the Electrical Review, who describes himself as a "call boy," makes the following interesting contribution:

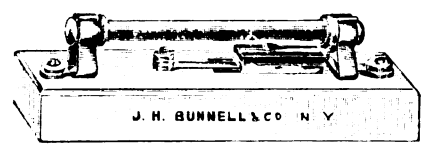
If you can hear above the clatter of the telegraph instruments and care to chat a few moments with the night call boy, all right. I like to read of Edison, who went up the grade like a sleek passenger engine, who with energy and nerve gave the throttle a couple more notches and plunged on and on in the darkness over an unknown track. They say he is an old man now, and I suppose he will die and I will never get to see him, but his achievements can never be forgotten. Here are his inventions all about the office. We pin carbon paper about the incandescent lamp so it will not shine so bright. There is the quad wire, two messages going each way at the same time; two counter-currents working through a neutral relay, says the operator, but I don't understand that. There is the carbon transmitter on the telephone, with which I saw one of the head men talk to New York City. There are relays, repeaters and condensers. Two Edison bipolar dynamos in the powerhouse one block away have been pulling the street cars for the past seventeen years, since 1891; just six years after the first electric street car system was built in America at Brooklyn. Two smaller bipolar machines supply the incandescent lights; one Brush and two General Electric machines have been added of late years. Yet great as Edison was and is, and as hard as he worked, serving us faithfully even in the autumn days of his life, he could not do it all. Kelvin, Bell, Tesla, Brush, Thomson, Roentgen, Hewitt, Marconi and a score of others seem to parallel his lines.

What electrical invention is more commonly used and is as far-reaching as the telephone? What does it mean to the call boy? It means this much—that if a few more of the trainmen had telephones the call boy could be dispensed with. I often call a train, engine and crew of five men in six minutes. An hour later a big freight train of forty cars goes thundering through the town.

About a year ago a train was held up about thirty miles south of here, one passenger being killed. The lady operator handed me a typewritten copy giving full particulars twenty minutes after the hold-up. Almost the same moment our special agent (detective) came in to get full information. I never even asked how he got the news so quick. I called the chief of police of this city (Fort Scott, Kan.), and read him the message. Then I called the constables of the smaller surrounding towns and advised them. Then the despatcher asked me to get an engine and bloodhounds started to the scene of the robbery as quickly as possible. I called the chief of police again and a number of parties in town, but it seemed that no one had bloodhounds or knew where there were any. Then it occurred to me that I could call up farmers on the farmer lines, so I began ringing up some old-time hunters down on Drywood, eighteen miles away, several of whom live in the hickorynut jungles that extend for half a mile on either side of the river. However, I did not locate bloodhounds, but the other fellow did by the same method, and they were hurried to the scene of the robbery and killing. Just calling anybody and everybody within a radius of twenty miles! How impossible this would have been one hundred years ago! Let us listen a moment to the telegraph instrument. St. Louis is talking to Pueblo on one wire. The despatcher is calling down a young operator on another. "What do you mean by guessing at train orders?" he says. But I must not tell stories out of school.

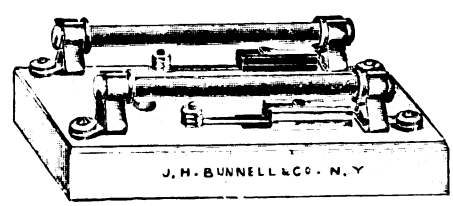
The Barclay Lightning Arrester.

John C. Barclay, assistant general manager and electrical engineer of the Western Union Telegraph



SINGLE POLE SET.

Company, New York, has patented a lightning arrester and protector for telegraph and telephone lines, which has been adopted as its standard by the company named. It is manufactured exclusively by J. H. Bunnell and Company, Inc., of New York, in both single and double pole form. The device, which is illustrated herewith, showing both forms, embodies some original and peculiarly effective features in construction, results reached after



DOUBLE POLE SET.

many years of experience and study of the subject and its needs on the part of the expert telegrapher whose exponential idea it is. The fuse caps are provided with flanges which prevent the fuses from being shaken out of their holders even when placed in a vertical position and when there is much vibration.

Colonel Plum narrates in his "Military Telegraph in the Civil War," that a telegraph line repairer who was highly expert in the use of climbers, was trimming trees at that time in Danville, Ky., preparatory to the stringing of a telegraph wire. An old woman who had watched his operations as an intensely interested spectator, subsequently, in relating the incident, said: "What can't them Yankees do! One of 'em just walked up and down the trees like a devil."

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Simultaneous Telephony and Telegraphy.

Francis R. Hoyt contributes an interesting article on simultaneous telephony and telegraphy in "Telephony," in which he explains, in part, by describing a "method to supply the so-called railway composite instruments to railroad companies for their private use on the telegraph lines operated by them. In many ways this is one of the most wonderful circuits ever put into practical use, as it can be added to any quadruplex circuit, and permits of four separate and distinct telegraph messages and one telephone communication to be in progress at one time over one grounded telegraph line, and that without introducing objectionable interference between the different circuits. This system is very efficient when used on grounded telegraph lines, and has been applied in some cases to lines over one hundred and fifty miles long.

"Another condition under which the telegraph has proven itself an adjunct to the telephone company, when operated by the latter, is in the case of a heavily loaded toll line, that is, a toll line which at certain periods of the day or night is so congested with calls that every minute lost by operators in making appointments, getting parties, up, etc., means dollars to the telephone company. If the telegraph is brought into play, appointments can be made, parties held, and, in fact, all the preliminaries of a future call, as well as all checking of past calls, can be done while the line is being used for actual conversation.

"In addition to these points of advantage to the telephone company there are numerous reasons why firms doing a private telegraph business, and especially brokerage concerns who furnish stock market quotations, desire the class of service offered by telephone companies. First of all, because the telephone side of the duplex means dollars to the telephone company, and in the case of a break down they exert every factor possible to restore service immediately, so that when faults of this kind occur the time which elapses in the interval is infinitesimal as compared with the time required by a telegraph company in restoring service under similar circumstances.

"The fundamental principles of simultaneous telephony and telegraphy are, in a few words, as follows: (a) You can telegraph through an impedance but not through a condenser, and (b) you can telephone through a condenser but not through an impedance. Simultaneous telephony and telegraphy is not new. In fact, there appears in the records at Washington a patent dated as early as May 7, 1878, covering what is to-day the first step in one of the most elaborate systems in use. This circuit is nothing more than a grounded telegraph line with condensers bridged around the telegraph relays or actuating apparatus to permit of the free passage of the voice currents. Though this circuit in its day was a wonderful advancement in telephony it had its drawbacks when put into practice, and in reality it is not a simultaneous circuit, as it was only intended to use the telephone at such times as the telegraph was idle. This, however, could be remedied by a proper arrangement of connections, but in that case we would encounter several drawbacks; chief among these being that for ringing purposes a high frequency current would necessarily have to be used, because to ring with a magneto or generator one side would have to be grounded and the current from the other side would chatter all of the relays whenever applied to the line, thus interfering with any signals which might be in transit at that time. The system was never adopted as a commercial branch or addition to the telephone or telegraph office, but it thoroughly demonstrated the fundamental principles as outlined, which proved the stepping stone for other great minds; and as a natural sequence there followed our present day simultaneous telephony and telegraphy systems. The railway composite used to such an extent all over the country to-day is merely an elaborate form of this simple circuit.

"We may say that simultaneous work is divided into four classes, which are as follows:

"First, simplex circuits, that is, a circuit by which one telephonic and one telegraphic communication can be transmitted over one metallic telephone line.

"Second, composite circuits, or circuits by which two telegraphic and one telephonic communication are made possible without the least interference over one metallic circuit.

"Third, quadruplex circuits, which render four telegraphic and one telephonic communications not only possible, but of the highest commercial efficiency, and when properly installed and balanced, give equally as good results as either the simplex or composite.

"Fourth, railway composites, so termed because they are merely telephone circuits added to the telegraph lines usually operated by railway companies, so that they can despatch their trains, or, in fact, conduct any business quickly and privately over lines already doing manifold duty and without paying a toll or having any additional maintenance cost. No matter how heavily loaded the line may be nor how old the iron wire, it is possible to secure a good conversation over distances of from one hundred and twenty-five to one hundred and fifty miles, and never know you are talking over a line carrying telegraph messages, provided the line is well insulated with respect to the ground.

"Simplex circuits in turn are divided into two main branches, i. e., those using repeating coils at either end of the line with the telegraph tap taken off of the line side of the coil, and those using a retardation coil with the telegraph tap taken off of the center of the coil. Both of these circuits are used extensively by long distance companies throughout the United States, some using one and some the other. In most cases it depends entirely upon the amount of telegraphic work they intend doing or will be able to do, which circuit they adopt. Primarily each has its advantages

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over the other, but from a commercial point of view, that is, as regards transmission, the retardation coil simplex has a shade the better of the two circuits, and can be rung over a considerably greater distance."

The Belin System of Telephotography.

A new method of reproducing pictures at a distance by electric currents over a connecting telegraph wire has recently been discussed in telegraphic and photographic circles. The method has been devised by M. Edouard Belin, of Nancy, France. It depends upon the fact, according to the Electrical World, that a photographic film of bichromate gelatin loses its power of swelling in water after it has been exposed to actinic light. Such a photographic film, after being exposed, developed and fixed, presents a rugged surface or variable contour, the ridges or salient points, which have swollen most, corresponding to the darkest portions of the picture, and the valleys or deepest points being those which have received the brightest lights. The photographic print is mounted on a revolving drum at the sending station, and a stylus rides on its surface like the pin of a phonograph. The up and down movement of the stylus as it rides across the ridges and valleys, corresponding to the light and dark streaks of the picture, are mechanically magnified and serve to operate a small but effective rheostat so as to modify the current in the line circuit. At the receiving end of the line is a synchronously driven cylinder. A small but strong beam of light falls on this revolving drum and produces a controlled photographic action on the sensitized drum surface. The variations in line current produce corresponding variations in luminous intensity in a rather ingenious manner. Each of the two cylinders makes about eighteen revolutions per minute, and the pitch of the helical thread is one-sixth of a millimeter. Consequently a strip three millimeters wide will be reproduced in each minute. A picture 9 x 12 centimeters is said to occupy about thirty minutes in transmission.

Up to the present time the apparatus is only described as having been tried either on short lines or on artificial lines. Nevertheless, it is to be hoped that the apparatus will be developed so as to be capable of operation on actual lines of ordinary length, if only to show what can be accomplished in the art of accurate telephotographic reproduction. It is of course no novelty at this date to reproduce pictures in some manner over a telegraph line. There have been, in fact, a number of such telepictorial methods suggested and tried at different times during the last sixty years, the efforts of one inventor after another having come to fruition and to record apparently without attaining commercial application. Two distinct types of operation have been employed, namely, electromagnetic and electrochemical. In both methods the receiving pen has operated in synchronism with the transmitting pen. Selenium transmitters and contact-makers, mechanical, chemical and electrochemical, have all been tried at the sending station. So far as we are aware, however, the up-and-down motion of a stylus upon photographically indented paper has not been brought out before. The reason that none of the preceding methods of fac-simile teleprinting has come into use is that there has not been sufficient demand for the operation of telereproduction of pictures to make the effort worth while. Any such method naturally involves skilled manipulation, and in the past there has been no demand for the commodity sufficient to overcome its cost in expert service and in telegraph line toll. There are many other possibilities in this category. For example, it has been demonstrated many times that it is quite practicable to communicate with moving railroad trains by means of electromagnetic induction from neighboring telegraph wires suspended in the ordinary way, near to and along the railroad line, but the method seems never to have come into commercial use, because it does not pay to employ a special operator on board a train when a telegram can always be forwarded from the next stopping place.

The Delay of Telegraph Messages in India.

It appears that the object of the Indian Government in appointing Mr. Newlands of London, of the British telegraph, to investigate and report upon the telegraph service, was to find and remove the cause of the great delays experienced in the transmission of telegrams in India. While in England 91.7 per cent. of the messages are put on the wires within ten minutes of their receipt, in India only 8.2 per cent. come within this limit, and no fewer than 57.6 per cent. are delayed over forty minutes. The delay, according to Mr. Newlands, is mainly due to unnecessary signaling operations, the compiling of useless returns and the inefficient organization of the hours of work. The new scheme of duties will not only accelerate the dispatch of business, but will also reduce the amount of night work.

As a result of negotiations with the Indian Government, the strike in the telegraph service has come to an end, and the men have returned to work, to carry out a five weeks' trial of the new system of watches. The Government has appointed a special committee to investigate the alleged grievances of the telegraph staff throughout India.

In going over a list of over one hundred men who now hold important positions in the railway service of this country, a number among them who have reached presidential offices, only seven in the entire lot began at posts endowed with any sort of authority. Ninety-three began at the lowest round of the ladder, simply as boys—office boys, water boys, messengers, shop apprentices and the like. The telegraph was well represented in the list, and proved to be a potent stepping stone leading to the very highest positions attained in executive management.

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The Military Telegrapher in the Civil War.

PART THREE.

Among the archives of Col. William R. Plum, of Lombard, Ill., the historian of the part the military telegraphers sustained in the Civil War, is a letter from John N. Brooks, who wrote to the Colonel from Nashville, Tenn., under date of April 14, 1879, at a time when the former was busily engaged in preparing his book for the press. He gives with much graphic detail the incident of a fight occurring at Gallatin, Tenn., when the Confederate colonel, John H. Morgan, surprised and captured the small Federal garrison at that point. So far as the affair concerned the telegraph, we take from Mr. Brooks' original story, the following, of date August, 1862:

"It was an exciting event when Colonel John H. Morgan, the noted Confederate guerilla chief, surprised and captured the town of Gallatin, Tenn., early one morning in August, 1862, overwhelming in his attack the small Federal force there stationed. The conduct of the raid was characteristic of the man whose quickness and daring and ability to turn up with his bold riders at wholly unexpected times and places, and at widely separated points—actions which were a constant menace and source of anxiety to the Union leaders.

"At the time mentioned I was agent and telegraph operator at Gallatin, of the Louisville and Nashville Railroad Company, and also filled the position of express agent, all interests being centered, after the customary manner, in the depot building. In the same structure on the floor above, I occupied a room which was set apart as my bedroom. About daylight on the morning in question I was partially aroused from a sound slumber by the heavy tread of some one mounting the stairs, but thinking in my half conscious condition that it was the porter, I simply turned over for a further nap, and paid no attention to the approaching footsteps. My equanimity as to what was going on, however, was short lived and rudely disturbed, for suddenly bursting in at the door a stranger, in rough garb appeared, closely followed by a second, both of whom, doubly armed with heavy navy pistols, cocked and pointed at my head, demanded my surrender in the name of Colonel Morgan. Raising up in bed I recognized the first man as John A. Ellsworth.* the famous telegraph operator who had attached himself to Col. Morgan's command. I have always recognized that discretion is the better part of valor. Moreover, Ellsworth's reputation had preceded him, and when I replied with alacrity to his fierce order, with an uncompromising, and, I fear, meekly uttered, 'Certainly,' I well knew what the consequences would be were I to refuse or even hesitate. War takes few chances under such conditions, and no denials.

"Ellsworth commanded me to get up and to get into my clothes. When I had reached the stage of putting on my pants, he abruptly broke in and asked me whether I had any money. When I said that I had a little, he once again brought his formidable looking-pistol into requisition and told me to "shell out." The command was peremptory and no dodging was permissible, and I quietly handed over my pocketbook, from which he extracted and counted out forty dollars, all it contained. Handing back the empty purse he asked me if that was all the money I had, and when I disclaimed the ownership of any more he cursed me for having so little. I was ordered to finish dressing and then to accompany my captor downstairs into the telegraph office. Once in the office he demanded the keys to my desk, opening which he proceeded to ransack, the first thing pounced upon being a package containing money, about thirty-five dollars, as I remember. It was addressed to a lady resident of Gallatin, and had been received from the express company but the evening before. Nothing was sacred to the big thief in whose power I was, for he clutched at this money and eagerly stowed it away in his capacious pocket, in company with my forty.

This self-banking operation concluded, and a further search of the room revealing nothing else of portable value, he directed me, with an oath, to cut in the telegraph instrument and find out where the trains were. This I did, for to disobey meant instant death, but conducted my actions in as awkward a manner as possible, my object being to convey the impression to the operators along the line that something was wrong at my office. Ellsworth, than whom there was no more expert operator, evidently became suspicious of me, for he finally placed me under a guard of ten or twelve men, and took charge of the telegraphing himself, at the same time trying to imitate my writing. But he apparently made a bad mess of it.

"At this time, it being now about seven o'clock, Mr. Culp, who kept the hotel across the way, just opposite the depot, and with whom I boarded, came in to notify me that breakfast was ready. I remarked that my environment was of such a peculiar nature just then that I didn't see how I could well go unless my guards would accompany

* George A. Ellsworth, who served as Col. John H. Morgan's chief telegraph operator during the Civil War, was possessed of an extensive and expert knowledge of the telegraph. It was a toss up with him which side he should serve, North or South, for he was a foreigner and without pronounced prejudices, but deciding in favor of the latter, he went into the service with all of his well known energy. His versatility, restless activity, good judgment, and daredevil proclivities, combined with his pronounced abilities as a telegrapher, well qualified him for the task he assumed and made him a valuable acquisition to Colonel Morgan. During the war he was continually furnishing the Federal army specious, yet false and misleading information over telegraph wires, which he frequently tapped, respecting Colonel Morgan's movements, thus enabling his commander to execute many maneuvers, to the chagrin and discomfiture of his Northern opponents. Mr. Ellsworth was a Canadian. He died at Antonia, La., November 27, 1899, while in telegraph employ, being found dead in his office with one hand resting on the key.

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me. Ellsworth remarked with a grim smile that we would all go, that his little party would, no doubt, do full justice to the hotel proprietor's table, and that he would lock up the office until our return. On our way out, it was necessary to pass the stairway leading to my room. Taking advantage of the opportunity afforded, I asked permission to go up and wash my face. The request was granted, but reluctantly, and with the injunction to 'hurry up.' I had secreted in my bed a pocketbook containing five hundred dollars, the result of long saving, and the first large sum of money I ever possessed. To obtain it I was naturally anxious. As good luck would have it, none of my guards showed any disposition to accompany me aloft. The pocketbook had not been disturbed and hastily glancing inside to see if the money was safe, I quickly slipped it inside of my bootleg, dashed a little water on my face, in order to keep up the deception, and then hurried back down stairs. I considered myself as extremely fortunate in securing the money and that no suspicion was attached to the errand to my room.

"After breakfast, of which my captors partook as if famished, and to the evident dismay of Mr. Culp, whose viands disappeared with marvelous rapidity, we returned to the office, where I was still kept under close guard by direction of Ellsworth, who again took charge of the telegraph instrument. After he had worked some time, and asked various questions regarding the whereabouts of trains, 'Jimmy' Morris, the depot operator of the road at Nashville, one of the brightest men in the profession, mistrusting that something was wrong at Gallatin, finally put the question whether I had received the bottle of 'nitric acid' he said he sent me a few days before. Ellsworth turned to me and wished to know if I got the acid. I promptly told him that I did not. Pulling out his pistol, always ready for instant use, and which he cocked and aimed at me, he exclaimed that he would shoot the top of my d——d head off if I lied about the matter. I replied that he had me in his power and could kill me if he chose, but that I knew nothing whatever about any 'nitric acid.' My positively uttered answer appeared to be satisfactory, for Ellsworth immediately resumed the key and assured 'Jimmy' that he had no knowledge of any nitric acid having been sent. This reply convinced 'Jimmy' that something wrong was up, for it was only a few days previously that he had sent me a bottle of whiskey, which bore the nitric acid label, affixed purposely, in order to trick the boys and keep them from drinking its contents, as otherwise they would have been sure to have done. Furthermore, I had made due acknowledgement of its receipt.

"As a matter of fact, when Ellsworth questioned me about the 'nitric acid,' I had quite forgotten, under the excitement of the moment, that the bottle of whiskey was so labeled. If 'Jimmy' had requested to know whether I had received the whiskey, undoubtedly I would have answered that I had, so that my reply at the time may be said to have been innocent of all guilt. Subsequently I recalled to mind the fact of the original label, but prudently held my peace, for I knew very well that it would never do to contradict the statement already made. But 'Jimmy' was not to be deceived; he and I had worked together too long; moreover he recognized the touch and felt satisfied that it was Ellsworth with whom he was talking. Then he let out on the Confederate operator, calling him everything that mortal man could think of. It was a tongue lashing long to be remembered. Ellsworth seemed to enjoy the situation, for he sat at the instrument and laughed immoderately at the volley of epithets that came directed to him over the wire, while I stood by under guard listening to the conversation, tickled at what I heard, and hardly able to suppress a laugh myself, yet at the same time not knowing what was to become of me.

"Poor 'Jimmy' was in bad health at the time and left Tennessee and the telegraph shortly after this episode. I learned subsequently that he went to sea for a whaling voyage. I never heard from him again.

"My guards continued to keep a strict watch over me until about ten o'clock that morning, when Washington Morgan, a cousin of Colonel Morgan, made his appearance, and immediately ordered my release. Taking me with him outside on the street, he informed me that I should not be harmed, but that on no consideration was I to leave the town. It was easy to secure my acquiescence to this injunction, a matter, indeed, in which I couldn't help myself. This matter settled, he grew confidential and requested to know where he could get a drink of 'Robinson County whiskey,' that being a staple beverage in Tennessee at that time, as it is even to this day. My acquaintance with the town served me in good stead, for the 'conversation water' was readily obtained at a place on the public square. My new-found friend, having sufficiently quenched his thirst, we became quite sociable, and returned to the depot together, he showing every disposition to treat me kindly. His interference, however, in my behalf, did not secure me from suffering from further spoliation at the hands of the marauders, for when, a little later, I again visited my room, a new twenty-five dollar coat and a number of shirts were missing. Yet with my life spared and the five hundred dollars safe in my boot leg, I concluded that a philosophic view of the situation was the correct one, and that, under the circumstances, self congratulations should prevail, rather than bemoaning the comparatively small loss I had sustained."

"Lightning Flashes and Electric Dashes," a book made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher; 160 large double-column pages; profusely illustrated; price, $1.50, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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Wireless Editor's Troubles.

Making a "wireless" newspaper is not an easy task. According to a writer in the New York Evening Post, the editor of a daily paper on board one of our modern ocean liners sometimes has a strenuous time of it in getting enough news together to fill the white columns. Dependent upon reporters thousands of miles away "at the other end of the ether," the editor has little choice save to twirl his thumbs and wait upon the pleasure of his wireless informants.

In telling of Herr Rabien, editor of the Ocean Gazette on board the Kronprinzessin Cecilie, and his troubles with reporters, the writer gives an amusing account of how difficulties are sometimes bridged. There are good wireless reporters and bad wireless reporters. There are some, according to Herr Rabien, whose color sense or whose flow of words is of just the proper sort. There are others whose ideas, or facts, rather, flow turgidly.

"Now, that Cape Cod operator," he will say, "ah, he is bad—very bad. When he sends news I must write more to it myself. But Poldhu is good, excellent, and Cape Race, but at Nantucket—I should like to hang that man. He adds to my troubles."

Here is an item of news sent out by an American wireless man:

"Bryan made a fighting speech in Carnegie Hall. The text of his speech was 'Thou Shalt Not Steal.'"

The editor swore over this, because other news had been short. He wrestled with the question an hour, while the paper waited. More matter—copy—was needed. Then—Eureka! He added from the storehouse of his fund of common sense: "Bryan was indorsing all the policies of Roosevelt, and bitterly attacking the Trusts."

That would have been all very well had not Poldhu fallen down in the interim. It did. Here was the despatch.

"London people are suffering from a mild type of epidemic influenza."

Herr Rabien swore again. With space to fill, here was a pitiful contretemps. No death list; no peculiar feature—no details at all. Bah! He thought of treating it humorously; a bit of verse, perhaps; but he could find nothing to rhyme with London, and nothing with influenza, except possibly Venezuela, and even that rhyme had its limitations.

He had to let it go. Space still yawned. At the height of despair came the following:

"At least twenty-four soldiers of the foreign legion perished in the heavy snowstorm of February 2." An inspiration here. A French paper of a date a week back lay on his desk. Here was a brief report of an engagement between French and Arabs, in which 500 sons of the desert were killed. Herr Rabien merrily dragged that in, neck and crop.

This was so good that the editor took an hour off for rest and recreation. When he returned he faced a fresh crisis. No news had come in, and the hour of going to press was at hand. There were still several inches to fill.

He went over all the despatches and stuffed them full of words, as his chefs at the moment were stuffing their capons. Still space remained.

Action was necessary. He went out on deck and interviewed an officer. When he returned he sat at his desk with a pleased smile and turned out a page of copy as follows:

"Moonset to-night at 11h. 35m.

"Sunset to-day at 4.56 p. m.

"Sunrise to-morrow morning at 6.55 a. m."

Then followed figures telling the passengers how many times they would have to walk about the deck to cover a mile. There was still a hole left. Even the paragraph showing how many feet there were in a land mile and a sea mile failed.

The consideration of showing how many feet there were in several thousand sea miles as a means of covering paper with printed figures suggested itself, but there was not time to compute that.

Despair! Then, just as the paper was going to press with a gaping blotch of white in the starboard column, the following came in:

"Lost! A gold veil-pin with pearls. If found, please return to the steward or to Room No. 438."

Herr Rabien seized it gratefully. He could have shaken the hand of the loser of the pin. He inserted it, and then placed a cut of an eagle below it. The hole was filled.

The Telegraph in Colombia.

The Department of Posts and Telegraphs of Colombia has extended the contract made in 1906 with Francisco J. Fernandez for the construction, repair and operation of the federal telegraph and telephone lines, for a period of five years, beginning with January 1, 1908. According to the agreement, the contractor must maintain the present lines in good repair and furnish material and apparatus for future construction, according to the terms laid down. He must also introduce the German type of Hughes instrument and establish a school for instructing operators in the use of this instrument, and also in the operation of wireless telegraph apparatus. At the end of five years the entire system is to be turned over to the government in good condition.

Extraordinary progress is being made in the telegraph extensions in Brazil. There are at the present time 60,000 kilometers of telegraph lines, including the coast and river cables; of this the government owns 27,349 kilometers, with 3,331 stations. Recently a new line of 2,100 kilometers has been erected between Rio Janeiro and Cuyaba on the River Madeira.

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Insulation Tests—Milliammeter Method.*

It is customary to make periodical tests of the insulation resistance of telegraph and telephone wires. Up to a few years ago these tests were made with the tangent galvanometer almost exclusively, but with the advent of direct-reading voltmeters and milliammeters, quicker and in every way more satisfactory methods for making tests were found.

The milliammeter furnishes an accurate and ready means of making these measurements, the results of which are directly figured out by Ohm's law. The simple method of making the tests is where the wires are all open at the distant station. The wire chief then quickly inserts his meter in first one and then the other, applying an appropriate battery until he has run through the entire number of wires on that particular pole line. All wires are grounded, except the one under test. This is to not only measure the amount of leakage between the wire under test and earth, but also any leakage which may exist between it and any of the other wires.

The test is ordinarily made with a double-scale milliammeter, employing the most sensitive coil, which usually records on the lower scale. This lower scale is usually calibrated in divisions of .2 milliampere (or .0002 ampere). Suppose that with a pressure of 100 volts a deflection of two divisions on "lower" scale is noted. This would denote that a current of four-tenths of a milliampere (.0004 ampere) was passing out to the "open" wire from 100 volts' pressure. Then, by Ohm's law, $R = \frac{E}{I}$; hence 100 volts ÷ .0004 ampere = 250,000 ohms, which would represent the total insulation resistance of the wire. In considering this test the mileage insulation resistance is always reckoned, and this is arrived at by multiplying the length of the wire in miles by the total or absolute insulation resistance. Assuming that the wire in this instance is 200 miles in length, then the insulation per miles would be 50,000,000 ohms, or 50 megohms.

* Extract from "Electrical Instruments and Testing," by Norman H. Schneider, written by Jesse Hargrave, a superintendent of the Postal Telegraph-Cable Company.

The Telegraph and the Desert Menagerie.

The following anecdote, says a telegram from Cairo, Egypt, is at present making the round of semi-official circles in Khartoum.

A little while ago a young telegraph operator was sent to a lonely station in the remote regions of the interior. From the small cabin which served as his dwelling and his office he could hear the roar of lions from a distance. This having occurred several times during the few days after his arrival, he became very much terrified, and despatched the following message to headquarters:

"Impossible to live here. Surrounded day and night by lions, elephants, tigers, rhinoceroses, hyenas, wolves, crocodiles, hippopotami, etc.; beg for transfer."

Two or three days elapsed, and the poor, besieged operator received no reply, which increased his uneasiness. Another official, who was stationed in the same district paid him a visit shortly after this, and the terrified operator related to him his woes and showed him the telegram he had sent. His visitor commiserated him, but pointed out that the list of wild beasts detailed in the message was a little exaggerated, as no wolves exist in the Soudan. Immediately another telegram flew over the wires to headquarters from the forlorn operator at the far-away station, and the following was its wording:

"Referring to my message No. X please cancel the word 'wolves.'"

When the last man left it was not known whether the forlorn operator had had his request granted. His earnest desire for accuracy certainly merited some consideration.

Condensed Signal Outfits.

The signal office of the United States army has recently perfected a field telegraph apparatus which is condensed, so to speak, into such small bulk as to be carried easily by a soldier on foot or on horseback. It occupies a small wooden box about a foot and a half long, and is in effect a complete telegraph station suitable for service in a campaign.

More remarkable yet, however, is a contrivance, weighing only five pounds, which comprises both a telegraph and a telephone outfit. The telegraph instrument is contained in a leather case no bigger than the kind required to hold a pair of ordinary field glasses, and in a small cylindrical box attached to it is an instrument which is a combined telephonic transmitter and receiver.

When an officer of the signal corps, or an enlisted man, wishes to use the telephone, he simply removes the lid of the leather cylinder, takes out the instrument, which unfolds, and applies the receiver to his ear—an action which brings the transmitter close to his mouth. Whether one is on foot or on horseback, this five-pound apparatus —the weight mentioned including the leather cases—may easily be carried slung over the back, so as to be ready for use at any moment.

Commenting on the 'round the world telegraph experiment recently made by a newspaper in Copenhagen, Ferdinand Wagner says in a Berlin paper: "There was nothing wonderful in the result. Two messages were sent by the editor to himself at Copenhagen. One went via Shanghai, New York and London and the other via London, New York and Shanghai. The first to arrive at its destination was the one which was sent east by way of Shanghai. It had to be retransmitted eight times, and was received at the Copenhagen office in three hours and twenty-three minutes after it had been sent away."

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FROM TELEGRAPH KEY TO MULTI-MILLIONAIRE.

A Sketch of Francis T. F. Lovejoy, of Pittsburg, Who Became the Business Associate of Andrew Carnegie.

BY ERNEST ROWE.

(Reprinted by permission from Leslie's Weekly.)

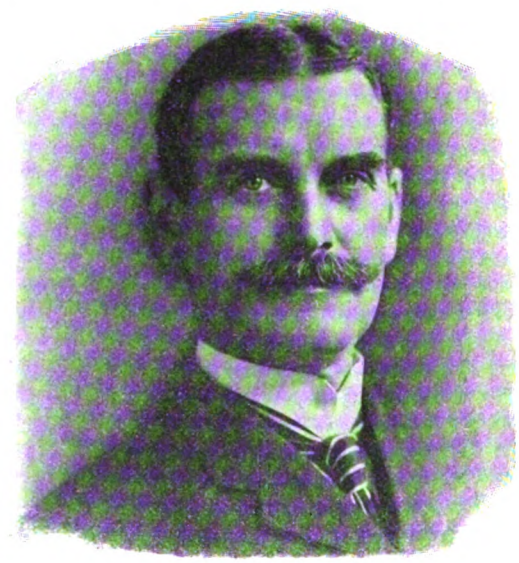
A visitor to the little town of Washington, O., in 1869, might have seen, if he had stepped into the village telegraph office, a tall, lean, brown-haired young fellow busily spinning off the dots and dashes. The initials which were signed to the messages were "F. T. F. L." The boy who delivered the telegrams, swept out the office in the morning, etc., could have told you that these letters stood for Francis T. F. Lovejoy, who had lately come to town from Maryland. The little office, scarcely more than eight by twelve, was not particularly inviting. Besides the table, on which were the telegraph instruments, and the small wood stove, which usually needed the touch of a feminine hand, there were just two chairs—one for the operator and one for the boy. In fact, the man at the instrument did not hesitate to make it known that loafing was not desired, and hence he did not provide any inducements by way of extra chairs or soap-boxes. Yet he was always courteous to strangers, though there was little possibility that the latter ever dreamed that they were talking to the future secretary of the Carnegie Steel Company or to the future president of the Sunnyside Mining Company; yet such was the case.

Mr. Lovejoy was born in a Southern farm-house, on the outskirts of Baltimore, on July 21, 1854. Along with the other boys of the neighborhood, he attended "the little red schoolhouse" and learned his three R's. Later we find him at the little telegraph office in Washington, drawing a monthly salary of all the receipts of the office up to twenty-five dollars. The weekly business scarcely ever amounted to more than five dollars, so he was not burdened with the size of the amount he had to forward to the telegraph company. The errand boy gave his services in return for instructions in telegraphy.

Leaving Washington, O., in 1870, Mr. Lovejoy went to a place of the same name in Pennsylvania, and was employed in the same business. For a short time he was "night man" on the Oil City (Pa.) Derrick. At another time he was employed by an oil operator, Alfred Bronson by name, to look after an oil refinery at Miller's Farm—a hamlet ten miles south of Titusville.

In 1880 Mr. Lovejoy went to Pittsburg, working at his old trade of telegraphy until he finally associated himself with Carnegie Brothers, who even at that time were well-known steel manufacturers. On speaking recently of Andrew Carnegie, Mr. Lovejoy said: "He first impressed me as being a very little man to be as big as he was." This association with Mr. Carnegie was destined to be of the greatest business value to Mr. Lovejoy. The latter was rapidly given more and more important work to do. He rose to be chief clerk of the company in 1882 and auditor in 1889. Shortly after he was made auditor, he was elected to the board of directors, and was given the office of secretary. In 1892 he had charge of the organization of the Carnegie Steel Company. With two others he, in 1900, arranged the consolidation of the Carnegie interests into the Carnegie Company. This company, by the way, was the model after which was patterned the United States Steel Corporation. When the task of consolidation was completed, Mr. Lovejoy left the Carnegie Company to devote all his time to his private enterprises.

It was when Mr. Lovejoy had full charge of the manufacturing costs of the Carnegie products



FRANCIS T. F. LOVEJOY.
Once a Telegraph Operator, but now a multi-millionaire.

that he began to hunt for something where the cost of marketing was reduced to a minimum. Often, in the steel business, it cost as much to sell the product as it did to manufacture the same. Naturally his thoughts finally turned to gold mining, for which product there is always a good market. It takes no commercial travelers to sell gold. It is the only product that sells itself. In 1902 a piece of mining property was offered to him, and after a most careful examination it was purchased. Since that time Mr. Lovejoy has spent over two millions dollars in developing this property and securing additional territory. To-day the Sunnyside mine is one of the biggest gold mines in the world. The most valuable lesson Mr. Lovejoy learned from his association with Mr. Carnegie was that secret of the latter's success—the ability to surround one's-self with men who know everything about their special line of work. Two things Mr. Lovejoy

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knows how to do—how to keep the manufacturing cost down and how to select men who know their business from A to Z. He has also been fortunate in having associated with him in the management of the Sunnyside mine men of the same sterling qualities as himself.

If Mr. Lovejoy had asked you to join him in the steel partnership with Mr. Carnegie and you had put a few thousand dollars in with him, you'd now be one of the "steel millionaires." Of course, you didn't have a chance, but perhaps Mr. Lovejoy will give you a chance to become one of his associates in the Sunnyside mine. Of this I cannot say for sure. But I do know it's an awfully alluring chance, and the best way would be to drop a line direct to Mr. Lovejoy, No. 50 Broadway, New York City. Tell Mr. Lovejoy something about how you are fixed financially—if you can invest with him a few thousand dollars or only a hundred or so. Then, if there is no more Sunnyside stock for sale, he will at least write you a personal letter telling you so. If, on the other hand, there is yet a chance to become associated with Mr. Lovejoy in this greatest of all his great endeavors, he will advise you how you may join him without a very great outlay. It is well to remember that opportunities to join real live millionaires in their enterprises do not come one's way very often. Also when these millionaires put their money into a venture they know absolutely in advance that the venture is going to be successful.

Do you suppose Mr. Lovejoy would have spent two million dollars on the Sunnyside mine unless first he had determined the exact worth of the property? Not much. To-day a man may determine the worth of a mineral property which is developed as accurately as one may measure dry-goods or weigh flour. Mistakes are not permissible nowadays. So, before the Sunnyside mine passed into Mr. Lovejoy's hands, every test known to modern science was put to it, and the property was not found wanting. This is characteristic of Mr. Lovejoy's business method in regard to any proposition—first an excess of critical caution, then either reject or accept it; if the latter, back it for all it's worth.

When Mr. Lovejoy bought the Sunnyside, it was but a prospect, but now, after his five years of development, it is the biggest gold deposit in the world. Does any one deny this? I think not.

Mr. B. H. Revonlds, superintendent, Central and South American Telegraph Company, New York, in renewing his subscription, remarked: "Telegraph Age needs no praise at my hands; it speaks for itself."

"Pocket Edition of Diagrams," etc., by Willis H. Jones, electrical editor of TELEGRAPH AGE, embodies more practical information concerning the telegraph than any book or series of books hitherto published. See advertisement.

The New Postal Office at Seattle.

The Postal Telegraph-Cable Company's Seattle office moved into handsome new quarters on the evening of April 21. The new location is at 732 First avenue, corner of Columbia street, in a four-story brick structure, which will be known as the Postal Telegraph Building. The floor space covers 2,675 square feet, providing ample room for all departments. The fixtures are oak, finished in dark color, with desks to match, and present a handsome appearance.

The manager, cashier, receiving and delivery clerks are in full view of the public, so that business can be transacted with great convenience. The superintendent's office, booking department and operating room are separated by glass-paneled partitions, the arrangement bringing out admirably the rich color of the fixtures.

In the operating room the wiring and equipment has been installed in a creditable manner by Division Electrician H. C. Shaw, of San Francisco. An oak switchboard case eight feet high and seven feet wide encloses a 24-wire main board and loop boards. Behind the switchboard is placed the coil racks and cross-connecting frames conveniently arranged for accessibility and light. A 50-wire cable enclosed in piping leads to the terminal frame in the basement. All inside wires and cables are enclosed in pipes. A dynamo bench has been provided for the three 380-volt and two 40-volt motor generators, while the 120-volt leads are taken direct from the power lead. Over the motor generators a handsome piece of Alaska marble, ten feet long and two feet six inches wide, on which the dynamo switches are conveniently arranged, adds to the attractiveness of the main switchboard.

The tables are Postal standard and provide space for four quadruplexes, two duplexes, four sets of Weiny-Phillips repeaters and twelve single Morse sets. A blower carries the messages between the operating room and delivery departments.

A feature of the new office is the window-sign arrangement. An enlarged facsimile Postal blank on the First avenue side has proved a great attraction and is admitted to be the most original window sign in the city. On the Columbia street side is placed the Postal trademark in enlarged form, which presents an artistic appearance.

Mr. E. J. Nally, vice-president and general manager of the company, under whose direction the office was planned, was a recent Seattle visitor, and was greatly pleased with the new quarters, which he considers the best on this coast. The location is ideal for a telegraph office, and credit is due Mr. J. A. Forehand, district superintendent, for his efforts in having the room arranged to suit the necessities of an up-to-date office.

The official personnel of the office is as follows: J. J. Dunne, manager; R. S. Clarke, cashier; E. S. Eller, chief operator; H. C. Bunting, night chief; C. D. Clarke, all night chief. Fourteen operators are employed, exclusive of the chiefs.

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The First Message By Telegraph.

A recent despatch from a town in Illinois said: "Leander Critchfeld, one of the oldest printers of this country, who received Morse's telegram, 'What Hath God Wrought?' when it was sent to Baltimore on the first official trial of the telegraph, is dead. Critchfeld was at that time a compositor in a Baltimore office, and his 'take' happened to include the article describing the trial of the telegraph."

The statement, says the Indianapolis News, is doubtless untrue. The same claim has been made by other "old printers." A well known member of the craft in this city says he personally has known four or five who have made it. The story has too many heroes, though they are nearly all dead. The truth is that the telegram referred to was not sent to the press nor to any newspaper, but to Mr. Morse's partner, Alfred Vail, who was operating at the Baltimore end of the line in connection with Morse at the Washington end to demonstrate the practicability of the invention. The inventor was not sending any despatches to the newspapers nor trying to exploit his invention in the press. He was wholly intent on making a practical demonstration of it.

The "first despatch" has an interesting history. During the years that Professor Morse was trying to get Congress to make an appropriation to test the feasibility of his invention the United States commissioner of patents was the Hon. Henry L. Ellsworth, of Connecticut. He was the father of Henry W. Ellsworth, for many years a resident and lawyer of this city, and was himself for several years a resident of Lafayette, Ind. He was an able man, a warm friend of Morse and a believer in his invention. The younger Ellsworth, Henry W., was of counsel for Morse in some of the big law suits connected with the telegraph patents. The elder Ellsworth was one of Morse's best friends in the long struggle to get an appropriation from Congress. In a letter to a friend written after the bill had passed Professor Morse wrote: "I watched with intense interest the progress and vicissitudes of the measure, through the House and then through the Senate. I had staked all I possessed on the issue. After much tantalizing delay the vote was taken in the House amid many attempts by ridicule to defeat the measure, which finally passed by a small majority. The amount of business before the Senate rendered it more and more doubtful, as the session drew to a close, whether my bill would be reached, and on the last day, March 3, 1843, I was advised by one of my Senatorial friends to make up my mind for failure, as he deemed it next to impossible that it could be reached before the adjournment. The bill, however, was reached a few minutes before midnight and passed. This was the turning point in the history of the telegraph. My personal funds were reduced to the fraction of a dollar and, had the passage of the bill failed from any cause there would have been little prospect of another attempt on my part to introduce to the world my new invention."

Professor Morse sat all of the last day and evening in the session in the Senate gallery hoping to see his bill come up. Shortly before midnight, convinced that it would not be reached, he left the capitol and went to his hotel, dispirited and almost broken-hearted. He had written to Mr. Vail, his partner, that "if the bill should fail in the Senate I shall return to New York with less than a dollar in my pocket." One can imagine the frame of mind in which he went to his hotel that night believing that his bill had failed in the Senate. As he came down to breakfast the next morning a young lady entered and coming toward him with a smile exclaimed: "I have come to congratulate you." It was Miss Annie G. Ellsworth, daughter of the commissioner of patents. "Congratulate me for what?" said the professor. She answered: "On the passage of your bill." The professor assured her it was not possible, as he had remained in the Senate chamber until nearly midnight and the bill was not reached. She then informed him that her father remained until the close, and in the last moments of the session the bill was passed without a division. The professor was overcome by the good news, and while shaking the young lady's hands he assured her that she should send the first message over the line when it was built.

The appropriation having been made, the construction of the line to Baltimore was begun as soon as possible and pushed with energy. The Whig national convention was to met at Baltimore, May 1, 1844, and a great effort was made to have the line completed by that time, but without success. By May 1 the line was open from Washington to Junction, 22 miles, and news concerning the convention, obtained from passengers on the cars, was telegraphed from Junction to Washington, beating the cars by nearly an hour. This was regarded as a great achievement. The line was completed to Baltimore on May 23, and on the 24th Professor Morse invited a number of his friends to assemble in the chamber of the Supreme Court and witness the first test.

True to his promise, he had invited Miss Ellsworth to be present. For the first message she offered, "What hath God wrought?" The whole verse in which the words occur (Numbers xxiii. 23) reads: "Surely there is no enchantment against Jacob, neither is there any divination against Israel: according to this time it shall be said of Jacob and of Israel, What hath God wrought?" Professor Morse was a profoundly religious man, and the message pleased him greatly. It was sent by Professor Morse himself in the old-fashioned dot and dash alphabet, which he had invented. It was received by Mr. Vail in Baltimore and returned instantly to Washington. Professor Morse said afterward: "This dispatch baptized the American telegraph with the name of its author," meaning that God was its author.

The strip of paper on which the telegraphic char-

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acters were printed was claimed by Governor Seymour, of Hartford, Conn., then a member of the house, on the ground that Miss Ellsworth was a native of Hartford. It was delivered to him by Miss Ellsworth, and is now preserved in the Hartford Museum. There is no contemporary evidence that a copy of it was sent to any newspaper.

Two days after Miss Ellsworth's message was sent, on May 26, 1844, the Democratic national convention met at Baltimore. James K. Polk was nominated for president, and Silas Wright of New York, for vice-president. The latter at that time was in the United States Senate, and in Washington. His nomination was immediately wired by Mr. Vail to Professor Morse in Washington, and by the latter communicated to Mr. Wright. In a few moments the convention was astonished by receiving a message from Mr. Wright that he respectfully declined the nomination. The president of the convention read the message aloud, but the convention refused to believe it was genuine, or that news of Mr. Wright's nomination could have been sent to Washington and his answer sent back to Baltimore in so short a time.

The convention therefore appointed a committee to go to Washington by rail and get Mr. Wright's reply, and then adjourned till the next day. When the committee returned and reported that the message as sent by telegraph was genuine, and that Professor Morse had sent it at the personal request of Senator Wright, the convention was astonished beyond measure. A committee was appointed to confer with Senator Wright, and Professor Morse arranged for an interview by telegraph. At this interview only the two operators and the parties immediately interested were present. Several confidential messages were exchanged, and the committee finally reported to the convention that Senator Wright was inflexible. The convention then nominated George M. Dallas, of Pennsylvania. This incident was a great triumph for Morse and a big advertisement for the telegraph.

The line between Washington and Baltimore, opened by Miss Ellsworth's message on May 24, 1844, was operated and exhibited without charge until April 1, 1845. Congress during the session of 1844-'45 appropriated $8,000 to keep the line in operation one year, and placed it under the supervision of the postmaster general. In order to test the profitableness of the enterprise he established a tariff rate of one cent, for every four characters made by or through the telegraph, that is, one-fourth of a cent for every letter or figure. This was the through rate between Washington and Baltimore, and there was no intermediate office. The rate took effect April 1, 1845.

During the first four days of April the receipts of the Washington office were one cent. On the fifth the receipts were 12½ cents. The sixth was Sunday. On the seventh the receipts ran up to 60 cents; on the eighth to $1.32; on the ninth to $1.04. From April 1 to October 1 the total expenses of the line, including the salaries of two operators, were $3,295, and the total receipts were $413.

In view of these figures Congress declined to make an appropriation to extend the line to Philadelphia and New York, and also declined an offer of the entire invention for $100,000. The postmaster general, in his annual report for 1845, expressed belief in the usefulness of the telegraph as a means of transmitting intelligence, but doubted whether it would be financially successful. Yet he thought it should not be left in the hands of private individuals. "The operation of the telegraph between this city and Baltimore," he said, "has not satisfied me that, under any rate of postages that can be adopted, its revenues can be made to equal its expenditures. Its importance to the public does not consist in any probable income that ever can be derived from it; but as an agent vastly superior to any other ever devised by the genius of man for the diffusion of intelligence, which may be accomplished with almost the rapidity of light, to any part of the republic, its value in all commercial transactions, to individuals having the control of it or to the government in time of war, could not be estimated. The use of an instrument so powerful for good or for evil can not with safety to the people be left in the hands of individuals uncontrolled by law."

Book Review.

"The Telegraph Instructor," by G. M. Dodge, manager of the Western Union Telegraph Company at Valparaiso, Ind., in its fourth edition and revised form (1908; pp. 260), sustains its past reputation as a teacher in the field it essays to cover, and keeps the book well abreast with the never-ending needs of both the commercial and railroad telegrapher for an academic volume of this character. It is admirably designed for the student, for in explanation and illustration it is clear and profuse. Its rules for correct typewriter fingering, applied more especially in conjunction with message receiving, are illuminating. The work should prove a welcome addition to the student—literature of the subject with which it deals. The price of the book is $1, and it will be sent postpaid to any point. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we sometimes have in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum, or even more. The growing value of complete files of TELEGRAPH AGE should cause our readers to carefully preserve their issues.

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The Evolution of the Telegraph Alphabet.

BY DONALD McNICOL.

(Manager at Salt Lake City, of the Postal Telegraph-Cable Company.)

A person might well be pardoned for not observing at first sight that the Morse telegraph alphabet is a scientific arrangement of dots and dashes, composed with the object of providing short signals for these letters which occur most frequently in English words. And also, with the object of arranging letter signs sufficiently dissimilar to prevent, or at least lessen, the likelihood of confusion.

Steinheil, of Germany, in arranging an alphabet for his needle telegraph, invented in 1834, found it necessary to compose a code made up of dots only, and that, without being able to take advantage of spaces. The alphabet as used by Steinheil permitted messages to be sent at the rate of six words per minute.

The invention of the Morse electro-magnetic telegraph in America in 1837, permitted of the employment of an alphabet composed of dots, dashes and spaces, and many different arrangements were proposed having for their object the formation of all required letters, figures and symbols having the greatest number of variations with the given elements; with single signs, $2 = 2$; with two signs, $2^2 = 4$; with three signs, $2^3 = 8$; with four signs, $2^4 = 16$; so, by using variations of from one to four of the two elementary signs we have $2 + 4 + 8 + 16 = 30$ variations for the formation of an alphabet. The length of a dot being the unit, the length of a dash equals one dot, between two letters of a word three dots, and between consecutive words six dots.

The formation of numerals in the International alphabet is quite ingenious, each being represented by five of the two elements, so that by disregarding the dashes on the right-hand side and giving a value of unity to a dot and two to the dashes on the left, the value of the figure represented is expressed.

The International alphabet as originally used in England had a number of signs which have been gradually discarded.

At the Berlin Telegraph Congress, held in October, 1851, the present International alphabet was compiled. The alphabet as it stands was supposed to embody the best features of all the then existing alphabets. The Germans and Austrians added the following letters to the code as adopted by the convention:

Ch ———— Ö ———. É . . — . .

Ä . — . — . Ü . . — — Ñ — — . — —

As an evidence of how various alphabets were picked over to form the International code it might be stated that the signs for the letters G, F, L and R were taken from Gerke's alphabet; E and H from Steinheil's. The letter X, the numerals 1, 2, 3, 4 and 5 from that introduced by M. Lefferts on the American Bain lines in 1849, while the numerals 6, 7, 8 and 9, also taken from the Bain alphabet, were arranged in reverse order. The remaining characters were adopted from the Morse alphabet.

The United States army uses the Morse code generally.

As to the advantages of one alphabet over the others it might be said that the Morse alphabet which is exclusively used in America, is more rapid than the International alphabet by two or three words per minute, but the International code is safer and less liable to error on account of the absence of spaced letters or dot combinations. In the International code there are no such combinations as . .. . or .. .. . a very considerable advantage, especially where the speed is fast.

NEW YORK, WESTERN UNION.

Mrs. J. A. Fleiger, nee Miss Lizzie Tuohey, formerly assistant traffic chief in the city line department, died on May 6, at her residence in this city.

George H. Goodfellow, of the all-night force, died on May 5, at the Kings County Hospital, Brooklyn, N. Y. A delegation from the office attended the funeral.

Martin B. Hills, aged sixty-three years, late of this department and for twenty-five years manager of the 599 Broadway office, died on May 4, at his home in Jersey City.

Frank Bowen, a veteran employe of this department, died on April 17, at his residence in Brooklyn.

Miss Jennie F. Powell has returned to this office from Jacksonville, Fla., where she had been employed during the winter for this company.

Martin Durivan, assistant southern traffic chief, has gone to West End, Long Branch, N. J., where he will fill the position of chief operator during the summer months, as has been his custom for the past twenty years.

F. E. Eastman, night manager of the Portland, Me., office, and his daughter, who is employed at the same point, visited this office recently.

F. O. Nourse, formerly general traffic chief at this office, and now assistant superintendent at Nashville, Tenn., was a recent visitor. Judging from his appearance, southern life is certainly agreeable to him, and the glad welcome he received from a host of friends here, must have afforded him much pleasure.

Philadelphia Magnetic Club Dinner.

The Magnetic Club of Philadelphia will hold its seventh annual dinner, denominated as a "shad dinner," on Saturday, May 23, at Washington Park, on the Delaware River. Guests will be conveyed to this point by a steamer specially chartered for the purpose and which, before landing, will make a two-hour excursion trip up the river. F. H. Lincoln, president of the club, and who is the assistant general manager of the Philadelphia Rapid Transit Company, is taking

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an active part in perfecting the arrangements for this dinner, which promises to eclipse all former affairs of the kind, and a large attendance is assured. The features of entertainment are in the hands of an able committee, of which F. E. Maize is chairman. Among the guests will be Mayor Reyburn, of Philadelphia; Director of Public Safety Clay and Assistant Director Sheehan. Speeches will be made by Mr. Lincoln, S. S. Garwood, J. Meyer, J. F. McLaughlin, chief of the electrical bureau of Philadelphia; C. B. Wood, secretary of the club, and others.

OTHER NEW YORK NEWS.

The New York Telegraphers' Aid Society makes the following statement for the year ended March 6, 1908:

Balance on hand March 6, 1907		$20,462.86
Receipts		7,453.47
		$27,916.33
Disbursements.		
Sick benefits	$4,351.11	
Death benefits	1,700.00	
Expenses	716.66	
		6,767.77
Balance on hand March 6, 1908		21,148.56
		$27,916.33
Summary.		
Receipts		$7,453.47
Disbursements		6,767.77
Gain for year		$685.70
Relief Fund.		
Balance on hand March 6, 1907		$4,213.00
Receipts		270.32
		$4,483.32
Disbursements		$413.60
Balance on hand March, 1908		4,069.72
		$4,483.32

Balances.

Aid Society	$21,148.56	On deposit	$25,014.92
Relief Fund	4,069.72	Cash on hand	203.36
	$25,218.28		$25,218.28

J. H. Driscoll, W. T. Rogers, F. J. Nurnberg, Auditors.

The Hulit Telegraph Key

Attaches to the frame of the typewriter and is a part of its keyboard. It reduces breaking to a mere motion of a finger instead of the old tiresome reach back of the machine to the wire.

Easier to break on than pressing a typewriter key.

Splendid exercise for paralysis.

Improves appearance of typewriter.

This is something you NEED. Order one and give it a trial. We guarantee full satisfaction or prompt refund of money. Price, $2; postage prepaid. Testimonials FREE. High-grade repair and experimental work. Prices reasonable. Sending machine parts and repairing. Write us. Sending machine Jacks, 50 cents.

JOHN A. HULIT & CO.

418 Kansas Avenue TOPEKA, KAN.

The Philadelphia Electrical Aid Society Has a Gala Night.

The Electrical Aid Society of Philadelphia held its eighth annual entertainment, banquet and dance in Mercantile Hall, that city, on the evening of April 29. It was a brilliant affair, between five hundred and six hundred guests being present, and A. S. Weir, president of the association, was enthusiastic over its success. An interesting programme of eight numbers was rendered prior to the serving of the banquet. Dancing followed and was long continued.

The American Union Telegraph Company has filed articles of incorporation at Augusta, Me., with a capital of $10,000,000. L. A. Ingalls is named as president; E. J. Pike, treasurer, and C. L. Andrews, clerk, all of Augusta.

Operators will find a fund of practical information in every issue of TELEGRAPH AGE.

Wanted.—Information as to whereabouts of Operator E. J. Hamilton. Address "S," care TELEGRAPH AGE, New York.

Shelter is one of the three prime necessities of life. In the acquirement of a home under the most attractive of conditions, telegraphers may confidently consult the Serial Building Loan and Savings Institution, 195 Broadway, New York. What it has done for thousands in the way of procuring homes, it can do equally well for you. Its facilities are at your service.

Advertising will be accepted to appear in this column at the rate of three cents a word, estimating eight words to the line.

Will buy or sell, in one to ten-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

Rubber Telegraph Key Knobs.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

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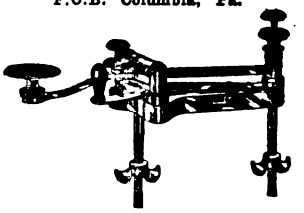

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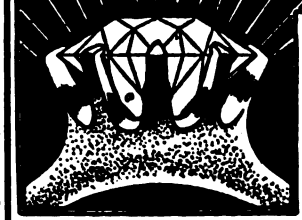

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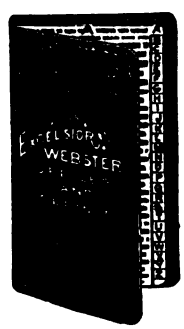

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Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

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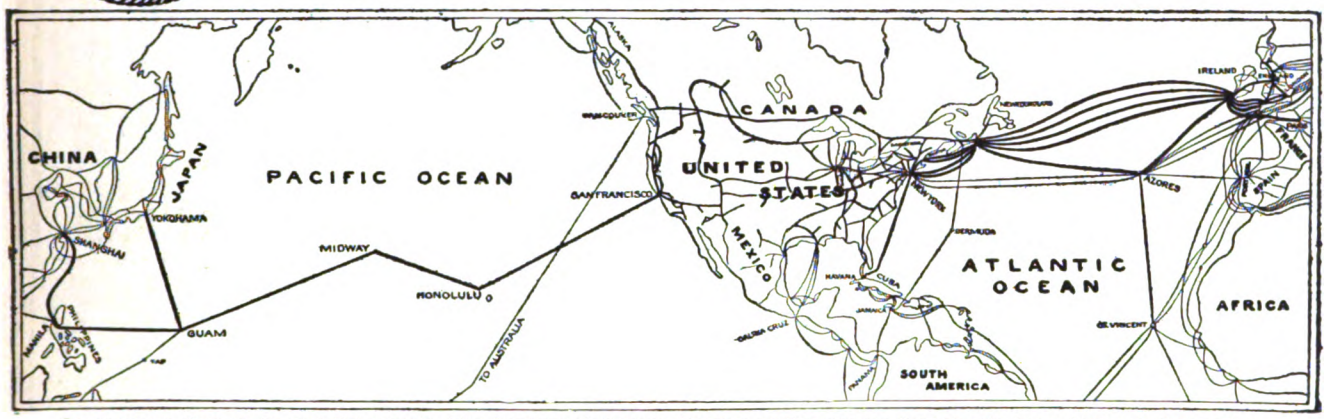

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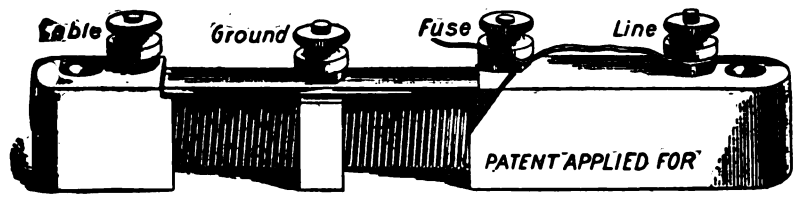

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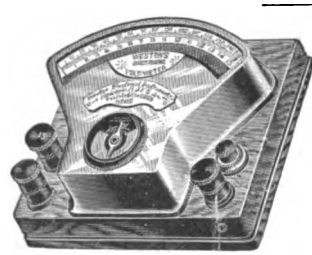

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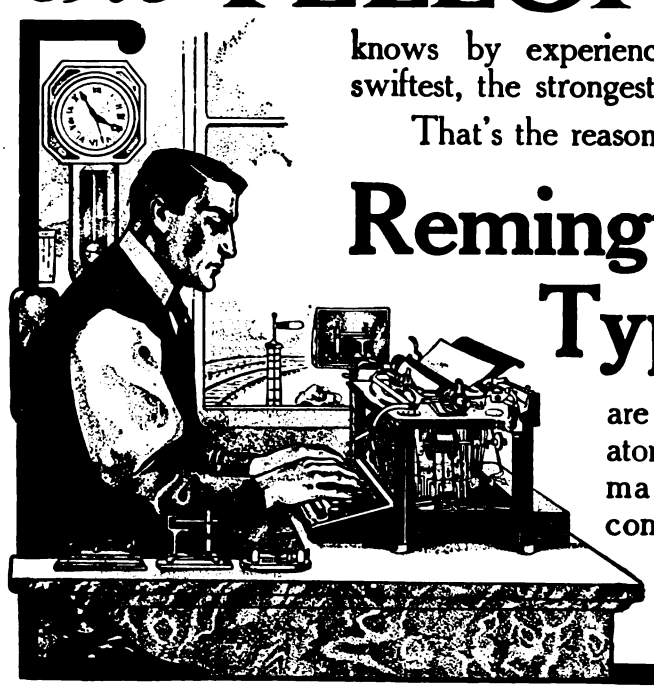

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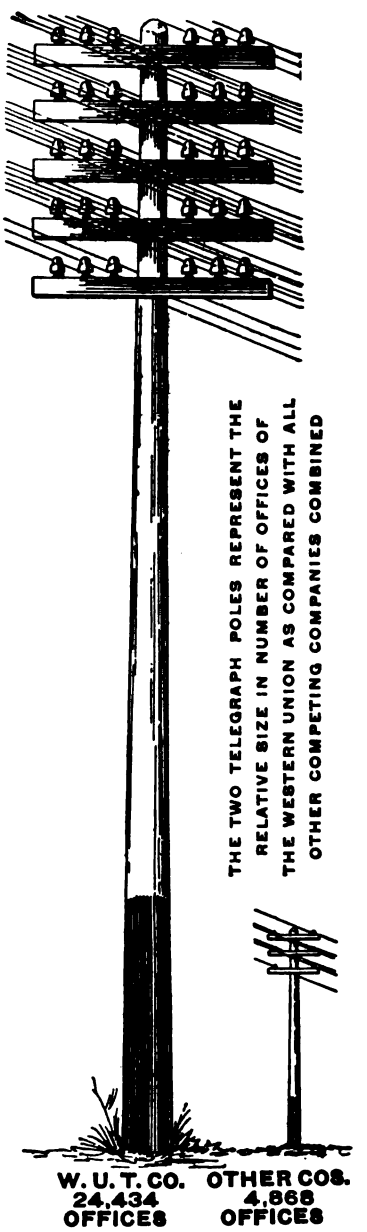

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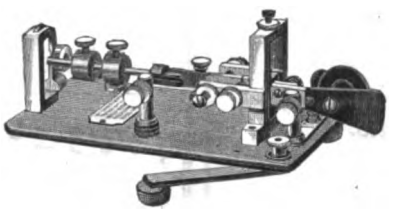

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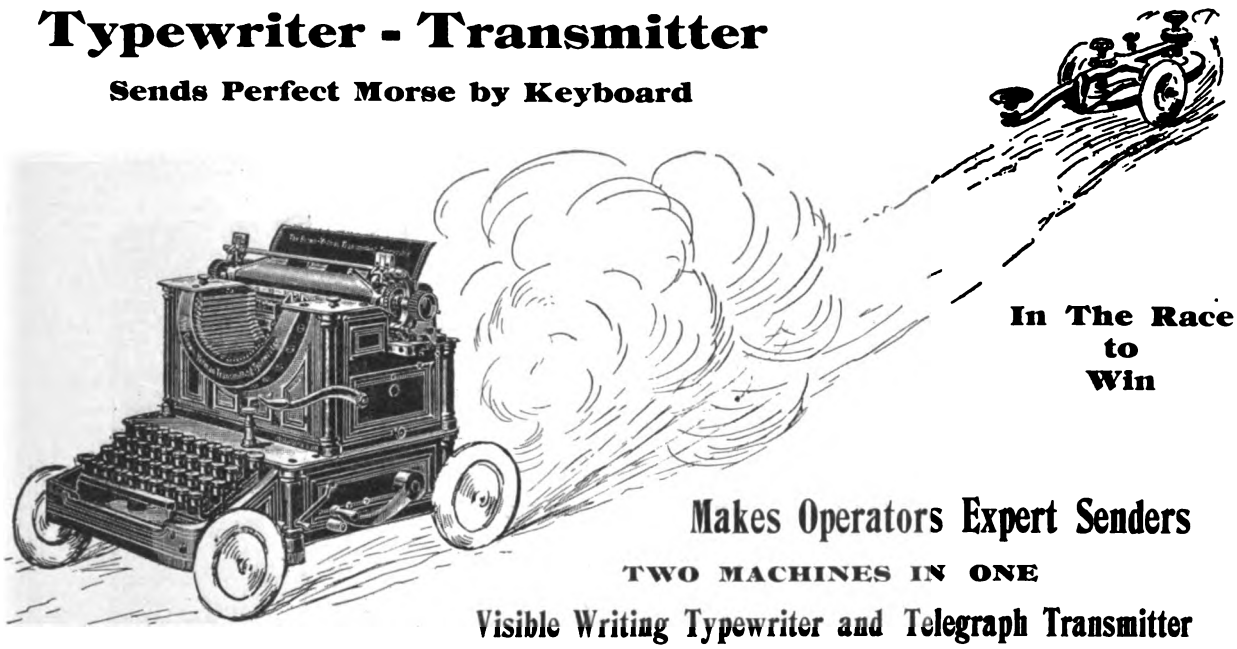

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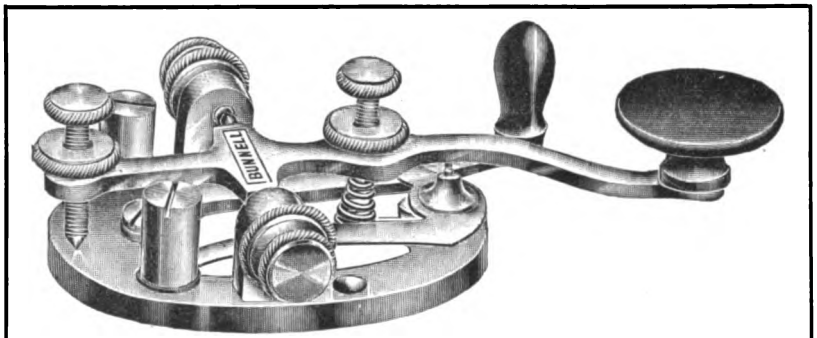

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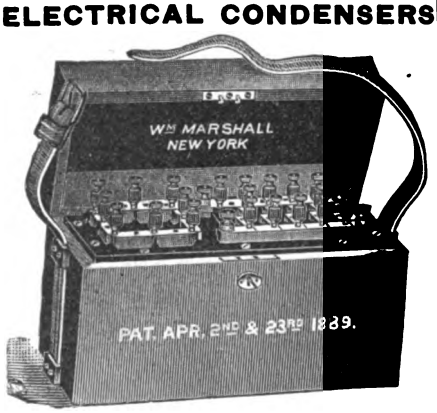

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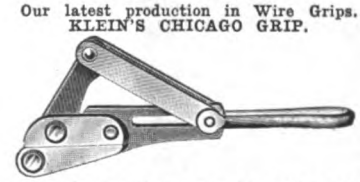

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SOME POINTS ON ELECTRICITY.

A Study of the Duplex Circuit.

BY WILLIS H. JONES.

Sometimes a very simple problem furnishes an interesting and instructive subject for discussion, especially among laymen. Recently a number of operators interested in the workings of multiplex apparatus had quite an argument among themselves over the question "What does the rheostat resistance obtained in balancing a duplex represent?" followed by other questions as to the means of determining by the balance the actual resistance of the wire itself, and to what extent the joint resistance of the artificial line and battery resistance play a part in the calculations.

Now, this is really not a difficult problem to solve if one stops to consider the facts in the case, but owing to the various points of view expressed by those entering into the discussion the conclusions arrived at in some cases were, to say the least, confusing.

For the purpose of illustrating the problem, let us refer to the accompanying diagram, Fig. A, with the different resistance values in the circuit marked out, and which represents the conditions cited when 2,000 ohms were required in the rheostat to balance the duplex apparatus. It was also stated that the distant station likewise balanced to 2,000 ohms.

Now some of the laymen contended that the 2,000 ohms in the rheostat represented the resistance of the multiplex circuit from X in the home apparatus to X^1 in the distant set. Others held that it measured the total resistance of the main line current, while a few rightly claimed that it represented the actual resistance of the external circuit; that is to say, all of the resistance which lies beyond the home relay—in still plainer words, the combined resistance of the main line wire proper, that of the distant main line relay coil, and the joint resistance of the distant battery and the artificial line circuit at that point.

To show the logic in this latter statement let us compare the relations that the multiplex battery, relay coils, and rheostat hold to each other with that of an ordinary wheatstone bridge and galvanometer outfit, as shown theoretically in Fig. B.

In this diagram the resistance coils A and B,

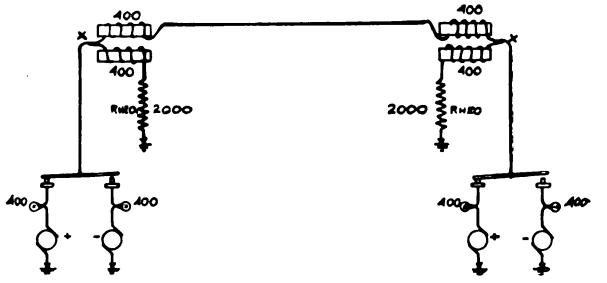

FIGURE A.

which in this case are made equal, represent the arms of the bridge, to which is connected a battery containing, of course, a resistance. The galvanometer is connected across the arm terminals at C and D. When a wire is connected to the terminal of arm X—C, and a rheostat to arm X—D, no current will flow through the galvanometer provided we balance the two circuits by inserting as much resistance in R as the line L contains. Hence when the needle stands at zero we know that the resistance of the rheostat indicates the resistance of the line, or external circuit. The value of the resistance in the arms makes no difference in the calculation whatever, provided it is identical in each arm. Whether we make it 100 or 1000 ohms the resistance in the rheostat required to balance the line will be the same.

Now, if we look closely at Fig. A it may be seen that the connections are very similar to those in the wheatstone bridge arrangements. The battery divides between the two evenly wound 400 ohm coils

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of relay, which latter thus act in the capacity of the two arms of a wheatstone bridge, the main line wire being connected to one arm, or coil, and the rheostat to the other. When the resistance in the latter is made equal to that of the external circuit, the balance is complete, and here, as in the former case, R represents the resistance of the external circuit beyond the relay coil or "arm." In like manner we might substitute a 1,000-ohm coil relay similarly wound for the ordinary instrument, without altering the home balance in the least, but the change would, of course, throw the distant station out of balance. This proves conclusively that the home relay must not be considered in the calculations, as would be the case if R represented the resistance of the multiplex circuit from split to split.

Concerning the part the artificial line plays in a multiplex circuit it is obvious that its presence or absence, as the case may be, can alter the total resistance of the line side, but a comparatively few ohms. In the circuit shown in Fig. A, for example, the joint resistance of the artificial line 2,400 and the 400-lamp or battery resistance, is about 343 ohms, a difference of but 57 ohms from that of the lamp, and a factor so small in comparison with the rest of the circuit as to be prac-

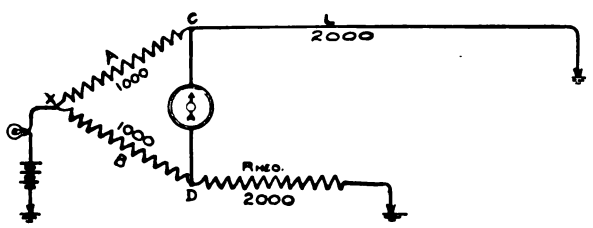

FIGURE B.

tically negligible. Even though the balance in wet weather should fall to 1,000 ohms the reduction due to the joint resistance then would not shorten the circuit quite 100 ohms. In any case where the circuit is good enough to be duplexed successfully, the artificial line will always be found to contain sufficient resistance to prevent the diversion of any appreciable part of the incoming current through that channel.

When, however, it comes to the problem of measuring the electromotive force of a distant multiplex battery with the apparatus at that terminal in circuit, the resistance of the artificial line does play a very important part. In fact, its connection in the circuit prevents the voltmeter from disclosing the value of any pressure beyond the "split" X^1, (Fig. A) for the reason that it acts as a leak and causes a "drop" in the voltage where the line proper is connected.

It is obvious then that in order to correctly measure the voltage of a distant multiplex battery with a voltmeter, or calculate the same by ohm's law from the current and resistance indicated, the actual conditions existing in the circuit should be thoroughly understood in advance.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 886,338, for a printing telegraph, has been awarded to John C. Barclay, of New York. A printing telegraph system of the stock-ticker type having means for operating a two-wire ticker or printer circuit from a distant transmitter by means of a single line circuit. Has repeating means whereby signals may be repeated into a further line circuit for operating tickers or printers.

A patent, No. 886,339, for an automatic telegraph transmitter, has been taken out by John C. Barclay, of New York. Automatic telegraph transmitters of the type in which the transmitting mechanism is controlled by a suitably marked or perforated message strip. Provides means whereby it is impossible to throw the hand transmitter into circuit without simultaneously stopping the feed of the message tape.

A patent, No. 886,355, for an invisible electric burglar and fire alarm, has been issued to James W. Dawson, of Kansas City, Mo. Relates to electric alarms, and more particularly to invisible burglar and fire alarm systems, which will be operated through the opening of the door or by a person walking against a thread stretched in such a position that it cannot be avoided.

A patent, No. 886,755, for a telegraph instrument, has been granted to Benjamin F. Bellows and Ambrose Behner, of Cleveland, Ohio. Has a key by which one movement will make dashes and another movement will release automatic mechanism to make dots until the return of the key to the normal position cuts off the dots. Makes use of vibrating pendulums having a different periodicity of movement.

A patent, No. 887,038, for a duplex telegraph, has been issued to John J. Ghegan, of Newark, N. J. A duplex system having differential or double wound relays and designed to have one or more intermediate stations in the circuit, and to duplex an ordinary way circuit for all or only some of the offices on the line.

A patent, No. 887,313, for telegraphic apparatus, has been issued to Frederick G. Creed, of Glasgow, Scotland. A telegraphic receiving apparatus is provided with a tape-feeding mechanism and a tape-punching mechanism controlled in accordance with the electrical impulses received.

Mr. E. A. Chenery, superintendent of telegraph of the Missouri Pacific Railway Company, St. Louis, Mo., in a recent letter, expresses his opinion of Telegraph Age in the following paragraph: "I am pleased to enclose a check to cover my renewal of subscription to Telegraph Age, and wish to say that I know of no other investment that furnishes such satisfactory returns for the small outlay. If your very valuable journal was placed in the hands of every operator in the country I feel sure the conservation of telegraph timber would be assured."

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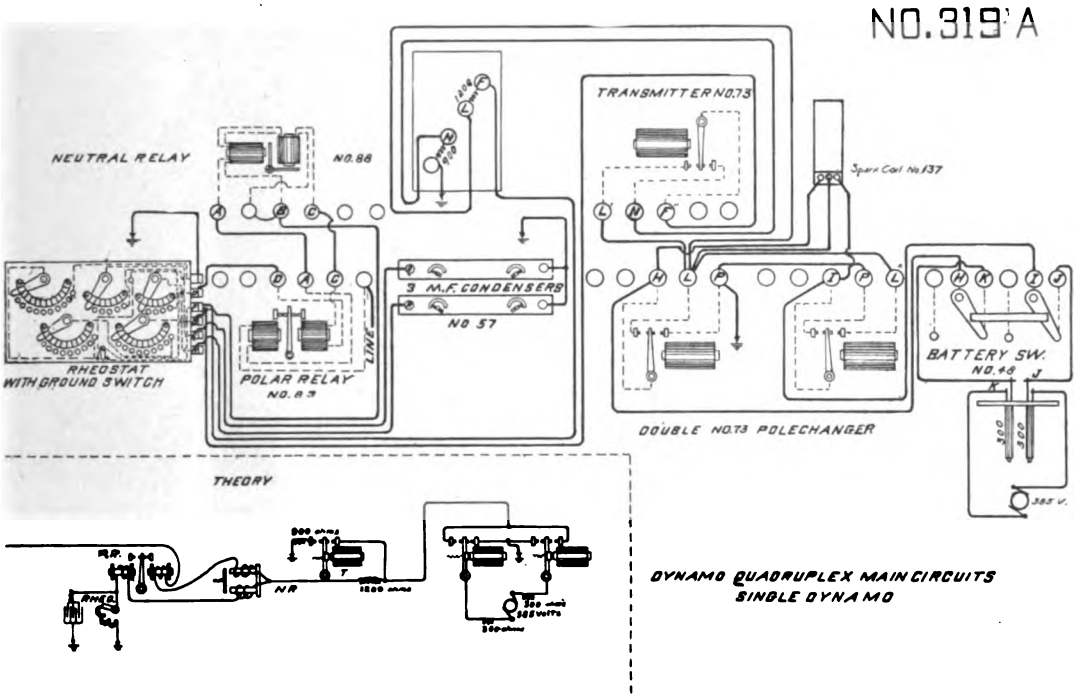
The Postal Single-Dynamo Quadruplex.

This journal will publish from time to time illustrations of apparatus in use by the Postal Telegraph-Cable Company. An explanatory sketch, written by John F. Skirrow, associate electrical engineer of the company, will accompany each presentation, in which the special instrument pictured will be considered in its application to the needs of the company. The series promises to be one of intense interest to a wide circle of readers, and its appearance in these columns will doubtless be eagerly welcomed.



The accompanying diagram illustrates the manner of operating a quadruplex from a single dynamo machine as used by the Postal Telegraph-Cable Company. It often happens that it is desired to use dynamo current for the operation of a quadruplex, but the service is such that it would not be economical to set up the regular standard dynamo equipment for this work. Where a single quadruplex is required, and it is used only a part of the time, a single dynamo machine worked on the plan shown provides a very simple, efficient and economical means for operating it.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Edward B. Pillsbury has been appointed general superintendent of the Eastern division, with headquarters at New York, vice E. G. Cochrane, retiring because of failure in health, effective June 1.

Mr. Leonard W. Storror, after almost half a century of active work in the telegraph service, will relinquish, on June 1, the arduous duties of general superintendent of the Pacific division, and will, after that date, serve the company as its representative for the Pacific coast, continuing his headquarters in San Francisco.

Mr. Jed G. Blake, now Mr. Storror's assistant, has been appointed general superintendent of the Pacific division, effective June 1.

Mr. Edgar W. Collins, superintendent at Cleveland, O., whose long continued illness, which at times caused him to seek hospital treatment, and which has occasioned his friends serious apprehension, has about recovered his health, and is able once more to attend to the duties of his office as formerly.

Mr. William A. Porteous, manager of the New Orleans office, has just passed a creditable examination in the law department of the Tulane University of Louisiana, and now awaits admission to the bar of his state.

The new office at Pittsburg, because of its up-to-date appointments, is attracting a great deal of attention both in and out of the service. Numerous members of the telegraph fraternity have visited the office and have become interested inspectors of all its details. Among Postal officials who have recently viewed this plant may be mentioned E. B. Pillsbury, general superintendent, New York; T. W. Carroll, division superintendent, Chicago; J. F. Looney, division electrical engineer, Chicago; J. P. Edwards, division electrical engineer, Atlanta; F. E. d'Humy, assistant electrical engineer, New York; S. B. Haig, superintendent of traffic, New York, and Charles Shirley, assistant superintendent of traffic, New York.

RESIGNATIONS AND APPOINTMENTS.

William H. Reagan, for many years manager at

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Fall River, Mass., has returned to that place in the same capacity, vice B. F. Gayton, transferred to Boston. John J. Welch has been appointed chief operator.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

George O. Smith, of Cleveland, O., was a recent visitor.

City Superintendent M. W. Hamblin, who has been absent on vacation leave, is again at his desk.

Barclay printers have recently been installed on the Chicago-Detroit, Pittsburg-Cleveland, and Philadelphia-Washington circuits.

For the fourteenth consecutive year the memory of Morse was fittingly observed on Memorial May, May 30, by the decoration of his monument in Central Park, New York, with flowers. This tribute of respect and love was performed by Marion H. Kerner and others, acting in behalf of those whose contributions for the purpose each year make such demonstration of remembrance possible.

The offices of the executive department wear a busy air these days, so much so as to especially impress the caller thereto. The officers, from Colonel Clowry, the president and general manager, to his near neighbor, J. C. Barclay, assistant general manager and electrical engineer; the vice-presidents, Mr. Van Every, Mr. Clark and Mr. Atkins, whose apartments are just beyond, besides Mr. Brewer, the secretary, and Mr. Fearons, the general attorney, not omitting Mr. Bristol and his assistant, Mr. Swortfiger, of the construction department, all on the same floor, have an atmosphere about them of intense application. And so it is throughout the big building, all are busy, observing hours that are early and late.

Personal.

Mr. John B. Bertholf, manager of the Western Union Telegraph Company, Jersey City, N. J., was elevated to the position of grand commander of the Knights Templar of New Jersey, at the annual convention held at Trenton, that state, on May 12.

Mr. Clarence H. Mackay, president of the Postal Telegraph-Cable Company, New York, in addition to $100,000 for the Mackay School of Mines, $30,000 for the John W. Mackay statue and $50,000 for campus improvements at the University of Nevada, at Reno, Nev., has announced further benefactions for the furnishing of the school of mines and an annual contribution of $6,000 for the maintenance of the school.

Mr. B. E. Sunny, a former Chicago telegrapher, who recently resigned as vice-president and Western manager of the General Electric Company, was elected president of the Chicago Telephone Company, on May 13, succeeding Mr. Arthur D. Wheeler, who becomes chairman of the board of directors. Mr. Sunny is also vice-president of the American Telephone and Telegraph Company and a director of the General Electric Company.

The Cable.

On the occasion of the fortieth annual meeting of the shareholders of the Indo-European Telegraph Company, held recently at London, J. Herbert Tritton, chairman of the company, with which he has been associated since its organization, was presented with a substantial token of the high regard in which he is held by his colleagues, and by the home and foreign staff.

Cable communication is interrupted May 27, with:

Venezuela Jan. 12, 1906.
Madura Island (Dutch East Indies) Feb. 3, 1908.
Island of Lanzorote (Canary Islands) May 18, 1908.
Steamer from Las Palmas.

The Mexican Telegraph Company, in its annual report for the year ended December 31, 1907, gives total receipts of $1,047,531, with total deductions of $182,163, leaving net earnings of $865,368, equal to thirty per cent. on the $2,879,100 of capital stock outstanding. Dividends of $287,010 were declared, leaving a surplus of $578,358, which, added to the previous surplus, gives a net surplus of $2,381,895.

The Central and South American Telegraph Company, in its annual report for the year ended December 31, 1907, gives a gross income of $1,749,045. Expenses were $556,666, and the net of $1,192,379 is equal to 11.9 per cent. of the $10,000,000 of capital stock. Dividends of $551,031 were declared, leaving a balance of $641,348. Adding the surplus of $607,936 to the previous surplus, gives a total surplus of $2,478,386, as compared with $1,870,450, for 1906.

Charles Henry Reynolds, aged sixty-four years, general manager of the British Pacific Cable Board, and a delegate to the International Telegraph Conference, died in the hospital at Lisbon, Portugal, on May 21. Mr. Reynolds entered the telegraph service in India, in 1866, after studying at the University College, London. He held many high positions in the telegraph service in India, and represented that country at the Berlin Telegraph Conference, in 1885. For ten years he was director-general of the Indian telegraphs. In September, 1901, he was appointed general manager of the Pacific Cable Board, and in this capacity in a tour of the world, was successful in promoting the interests of the all-British Pacific cable system. He was well known in telegraph and cable circles throughout the entire world. A year ago he visited the United States and Canada on business connected with cable interests.

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Mr. Pillsbury, General Superintendent of the Postal Telegraph-Cable Company.

Edward B. Pillsbury, who, on January 1 of this year, was transferred from the superintendency at Boston to the division superintendency in New York, has been promoted to be general superintendent, vice E. G. Cochrane, who has retired on account of continued ill health. Mr. Pillsbury is a man of ability, has had a long and varied experience as a telegrapher, and possesses a close familiarity with the business

EDWARD B. PILLSBURY.
General Superintendent, Eastern Division, Postal Telegraph-Cable Company, New York.

in all of its details. He was born at Belfast, Me., May 3, 1856. When but nine years of age he became a messenger in the service of the American Telegraph Company, in his native place. Apt, and always of an observant nature, he readily learned to telegraph, and acquired much rudimentary acquaintance with the business for one so young. At twelve years of age he was placed in charge of the Western Union office at Belfast, two years later being transferred to Bangor, and there assigned to The Associated Press wire. During the two years following he employed his leisure time in pursuing his studies under the guidance of a private tutor, who fitted him to enter the Maine State College at Orono, when sixteen years of age. Young Pillsbury was a painstaking student, and for the two years he remained in the college showed much industry, working as an operator during times of vacation. Leaving college he went South, and for a year was employed as an operator by the Southern and Atlantic Telegraph Company at Montgomery, Ala. In 1875 he located at Boston, there entering the Western Union service under Manager George F. Milliken. Mr. Pillsbury had developed into an expert operator. Always of a studious and thoughtful disposition he became as close a student of the technique of his profession as he had previously displayed in his college course. For four years he was engaged on the night force under the immediate direction of E. F. Leighton, the night manager of the office. In 1879 Mr. Pillsbury received the appointment as chief operator in the Boston office of the American Rapid Telegraph Company, his promotion to the managership occurring in 1882. He subsequently entered the employ of the Bankers and Merchants and the United Lines telegraph companies. His connection with the Postal Telegraph-Cable Company dates from 1886, entering its Boston office as chief operator. In 1891 he was made manager. On February 15, 1894, he was promoted to be assistant superintendent, his further advancement to the place of superintendent occurring May 1, 1899, which he continued to hold until his removal to New York as before noted.

Mr. Pillsbury possesses a wide acquaintance and has attained success as a superintendent because of executive capacity and knowledge of the business, enabling him to meet and pass upon problems of management; and because of the exercise of good judgment and tact in dealing with subordinates, with whom, and by associates, he has at all times been highly esteemed. Mr. Pillsbury has traveled extensively abroad and has been a close observer of foreign telegraph methods, which he has made more or less of a study in comparison with those in this country.

J. G. Blake, Postal General Superintendent at San Francisco.

Jed Gilman Blake, assistant general superintendent at San Francisco, of the Postal Telegraph-Cable Company, has been promoted to the general superintendency, vice L. W. Storror, appointed to

JED G. BLAKE.
General Superintendent Postal Telegraph-Cable Company, San Francisco, Calif.

the newly created office of Pacific Coast Representative. Mr. Blake is a New Englander, having been born February 6, 1860, at South Royalton, Vermont. He began his telegraphic career in 1876 in the employ of the Central Vermont Railroad at Milton, Vt., in which service he remained until December, 1879, when he was appointed manager of the American Union Telegraph Company at St. Albans, Vt., subsequently filling a similar position at Burlington, that state. In January, 1881, he

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became manager of the Western Union Telegraph Company at Glens Falls, N. Y., a year later accepting the managership of the Mutual Union Telegraph Company at Burlington, Vt. After two years in this position he became temporarily associated with the Vermont Central Railroad, but in September, 1883, went to Montreal to assume the place of chief operator of the Canada Mutual Telegraph Company. From October, 1886, to July 31, 1889, he filled the position of inspector of the Canadian Pacific Railroad Company's Telegraph. This he resigned to take charge of the Postal Telegraph-Cable Company at Seattle, Wash., an office he continued to hold until April 1, 1902, when he was made superintendent of the company, with headquarters at that point. His fine executive abilities soon gained him larger recognition, and on February 1, 1907, he was elevated to be assistant general superintendent at San Francisco, from which, as first stated, he has now been promoted to the general superintendency.

The Railroad.

The twenty-seventh annual convention of the Association of Railway Telegraph Superintendents, appointed to meet at Montreal, Que., on Wednesday, Thursday, Friday and Saturday, June 24, 25, 26 and 27, will undoubtedly be a meeting that will rank among the most important of the long series ever held. Among the numerous subjects that will come up for consideration, none are likely to receive more attention than the application of the telephone for train despatching purposes, now coming into such vogue. Those who intend to make exhibits of apparatus of any kind on this occasion should bear in mind that a custom house intervenes between this country and Canada. That fact need not, however, work a hardship, for the question of duties will be met and overcome if exhibitors will invoice their goods in triplicate. They will be passed and duty collected, but the amount so paid will be refunded when the goods are returned. A declaration of all such entries should be made to the United States customs authorities before leaving the country that the goods are to be returned.

General Manager R. H. L'Hommedieu, of the Michigan Central Railroad, is authority for the statement that the telephone is well adapted to the work of train despatching, and that "the results are more satisfactory than in the present method of telegraphic despatching. It is quicker, and every bit as safe. A despatcher sits with a headpiece with receiver at his ear and mouthpiece attached, and as he tells his orders over the telephone he writes them down, giving the operator at the other end, in this way, time to do the same. The operator to whom he is speaking then repeats the orders as he has them written, and if this reply is correct the despatcher gives the order his 'O.K.' and it goes on file. The operator may talk back, giving what he has received much quicker than he can by the Morse instrument, and the dictation of the order over the telephone takes no more time, if as much, as the present Morse telegraphic system.

"We are now investigating the cost of the initial installation, and I can see no reason why some of our branches should not be equipped with the telephone despatching service during the present year, and in time it will probably supersede the telegraph on the entire system." Mr. E. H. Millington is suprintendent of telegraph of the Michigan Central Railroad, and will have charge of these installations.

THE TELEPHONE ON THE ILLINOIS CENTRAL.

In reply to a letter of enquiry, Mr. G. H. Groce, superintendent of telegraph and signals of the Illinois Central Railroad Company, at Chicago, writes as follows concerning the application of the telephone in train despatching in his system:

This company has used the telephone to some extent in train despatching for several years. The application, however, was confined to lines under construction, which, after completion and turned over to this road, the telephone system would be discarded for the telegraph. The change from the telephone to telegraph was not made because any trouble was ever experienced, but simply because telegraphic practices of many years were considered standard. About four years ago the installation of a large mileage of controlled manual block, which was operated by telephone, brought us a step nearer to the use of the latter instrument for general train despatching. Early in March of this year a telephonic train despatching circuit was installed between Chicago and Kankakee, Ill., a distance of fifty-five miles, and since that time the despatching of all trains in that district has been done by telephone. The experiment has been successful and has given satisfaction to all concerned. Arrangements are being made for an extension of the practice. Ordinary commercial transmitters and receivers are used, but the arrangement in the offices is somewhat different from the usual wall or desk sets. The transmitters and receivers are so arranged that they can be handily operated, either at the despatching offices or at the offices out on the line, while the men are free to use both hands in copying train orders and doing other necessary work connected with train despatching.

The despatching circuit is necessarily of a different nature from the ordinary exchange service, as it is necessary to have a number of offices on one circuit. This made the ordinary generator or battery type of call impracticable, and it has therefore been necessary to develop some kind of a practical selective call. Up to a few months ago there was but little demand for a selector, and for this reason not very much attention had been given to the development of such an instrument. Several selectors are now on the market and the one which we have had in service on the line between Chicago and Kankakee has given entire satisfaction. Some improvements have been made in this particular type of instrument since that installation and seventy-five additional machines of the new type will be installed within a few weeks. One district will be equipped with a different type and the adoption of a standard will depend upon results obtained from the different kind of machines we test by actual operation.

From results which have been obtained by this company and two other companies with which I am acquainted, it is my opinion that the practice of despatching trains by telephone will increase rapidly.

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Cable Men at a London Banquet.

Sir John Wolfe Barry, K. C. B., gave a dinner in London recently to the directors and staff of the Eastern and Associated Telegraph Companies. Besides the gentlemen thus included a number of guests well known in telegraph and cable circles were present, among whom were: Messrs. George G. Ward, Frederick Ward and Albert Beck, of the Commercial Cable Company. In the course of an address delivered on the occasion by Sir John Denison-Pender, he said:

They were face to face with another International Telegraph Conference, and he felt he must say, so far as the telegraph companies were concerned, that it was unfortunate that these meetings were held so often, and he was not sure that there was much benefit derived by the governments of the world from these Conferences. The companies had no vote, and were only able to put forward statements and to ask the governments to support them in maintaining a fair and reasonable tariff for their messages. Up to quite a few years ago Great Britain and Denmark could claim the parentage of all the companies owning the submarine cables of the world, but more recently America, France, Gerany and Holland had come into the business and were competing for traffic. So far as their American friends were concerned they were in a different position from the others. They were independent of government control of their submarine service, and could also control the land lines of the country. In the early days of submarine cable enterprise fighting was considered the proper course to adopt. But it was not long before those who promoted this great enterprise arrived at the decision that friendly rivalry was to be preferred to fighting, and while the Great Northern and the Indo-European companies were among those who engaged in the contest, and fought with an energy which was to be expected from the able men who directed the fortunes of those companies, it was pleasant to know that satisfactory working arrangements were the ultimate outcome of the negotiations which ensued. Although the companies remain on competitive terms for traffic, they now all work in the most amicable way. The arrangements between the companies were in no sense against the public interest, which were well cared for by the governments of the world, apart altogether from the steps taken by the companies to safeguard them. The rates charged for submarine telegraph messages were fair and moderate, and only allowed a reasonable dividend to be paid and a proper strengthening of the reserve funds of the companies in order that existing cables may be renewed when necessary and that new cables may be laid to meet the public requirements. The strength of the British cable companies was in the fact that they had not only laid additional cables alongside the older cables, but had endeavored by alliances to form such a network that total interruption had become almost impossible. What was required now was a certain strengthening of the land line communication. This was gradually becoming accomplished by the laying of underground cables, and for this improved service the cable companies had to pay their share. He was sure the cable companies suffered more from the breakdown of the land lines than from the breakdown of their own submarine lines. He coupled with the toast the names of George G. Ward, of the Commercial Cable Company, and K. Suenson, of the Great Northern Company.

Mr. Ward thanked the company for the cordial manner in which the toast had been received. The Associated Companies always seemed to him to enjoy peace and harmony, while those who were engaged in the Atlantic service seemed always armed for war, and he usually found himself on the fighting side. This was probably due to the keen competition they had to encounter. He was very pleased to see present his great opponent and old friend, Mr. J. H. Carson. He had always thought that Mr. Carson and himself could furnish the material for an interesting book on "The Trials and Tribulations of a Competitive Cable Manager." This book should have a large circulation, for it would give hints as to how to regain and to retain a customer, and how to deal with a customer who complained that he had lost a large sum of money owing to his message arriving too quickly. In such a case as this the customer always ended by threatening to go to the "other company," and he supposed that meant that he went to the Anglo because he could there get a little slower service. He felt sure such valuable hints would be of service to their friends the Associated Companies. This was, however, hardly to the point. Speaking of the Associated Companies took him back nearly forty years, and one could not mention this great enterprise without asking who created it. It was a master mind, a man of great courage and untiring energy, of great foresight and broad views. When they considered what the late Sir John Pender did for the British empire and for the public at large he might well be termed the "Cable King." He brought the colonies within a few minutes' touch of the mother country. He commenced with the Atlantic in the early sixties, and was continuously engaged in the extension of submarine telegraphy to the day of his death. He (Mr. Ward) served under him for several years, and appreciated his work. He had often asked himself whether the services of this great man had been adequately recognized, and he felt that this had not been the case. They were all gratified to know that the management of the Associated Companies was being carried on by his son, Sir John Denison-Pender, a man devoted to his work, and with every detail at his fingers' ends. Then as to the rank and file. He did not know where they could find a more loyal and efficient staff. Before resuming his seat he would like to say a word about their chairman, Sir John

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Wolfe Barry. The Associated Companies had at their head a man with such ability that they could not go wrong. His broad views and his grasp of the situation were remarkable. With such a chairman, and such a managing director, and such a staff the ship could never sink. It afforded him great pleasure to respond to the toast.

Radio-Telegraphy.

The submarine cable between Nantucket and Martha's Vineyard, which has been broken for sometime past, was repaired recently by the cable steamer Western Union, thus restoring land line connections of the Nantucket wireless telegraph station.

A patent, No. 887,598, for an electrical condenser suitable for use in wireless telegraphy and other purposes, has been granted to Lucien Henri Delloye, of Paris, France. An electrical condenser comprising a pair of wire nettings imbedded in a block of glass.

A patent, No. 886,983, for a coherer and decoherer, has been awarded to Joseph L. Jones, of Kizer, Tenn. The patent covers a decoherer electromagnet, an armature arranged within the field of force of the magnet and having a hooked end, a make-and-break device and a coherer supported by the hook.

The United State Signal Corps conducted recently some experiments with wireless telegraphy from a balloon. A receiving wire was hung from the basket, which latter was covered with wire netting. With the balloon over Washington, wireless messages from Annapolis were clearly received. Major Edgar Russel, who had charge of the experiment, said that wireless telegraphy from balloons will prove most useful in warfare, as a balloon could float over a battle-ground and give the commanding officer exact details of every move made by the enemy.

The English Post Office Circular contains a notice to the telegraph department that telegrams intended for transmission to Montreal by the Marconi Company's wireless service (via Clifden) can only be accepted at post offices as inland telegrams, addressed to "C/o Expanse, Galway." If replies to inward telegrams received by the company's service are prepaid, the prepayment covers, so far as the Post Office Department is concerned, the inland transmission only, and the reply must be addressed, like other outward telegrams.

The guests of the Plaza Hotel, New York's newest and largest hostelry, will shortly be able to communicate with friends on transatlantic steamers without leaving their apartments. The work of installing a wireless station on the hotel roof, three hundred and nineteen feet above the street level, has been begun, and the three steel flagstaffs already on the roof reduces to a minimum the expense of constructing the station. The De Forest system will be used, and the management of the hotel will own the station, which it will build and operate. An operator will be at the station every day, and arrangements will be made for telephone communication between the operator and every room in the hotel.

The "Edinburgh Review," for April, according to an English exchange, contains an instructive article with the title herewith given in which the author reviews at some length what may be termed the radio-telegraph position, the object being to place readers of the "Edinburgh" in possession of the main facts concerning the history of what may be termed the new science and practice of communication by means of electromagnetic waves. The value of the investigations of several of the principal workers in radio-telegraphy is duly credited, including that due to Sir Oliver Lodge for his famous lecture introducing the subject at the Royal Institution in 1894. The bearing of recent legislation upon the practice and industry of wireless telegraphy is well shown as is also the necessity for legislation in order that radio telegraphic working may be under effective control. How necessary such legislation had become and how desirable it was that the state should step in and organize the business of radio-telegraphy is also well shown by the writer, who has a clear grasp of his subject and writes in a manner both instructive and interesting to the lay reader. It is, of course, in the field of ship and shore work that the greatest advance in radio-telegraphic operations has been made, and the writer of "The Politics of Radio-Telegraphy" has a great deal to tell us of the political aspects of the question. The interest taken by the German Emperor in this subject from the earliest date, resulting in his invitation to the powers for a conference in Berlin, as far back as 1903, is noted.

A New Canadian Telegraph Company.

A new telegraph company, which proposes to extend its lines from coast to coast, and to cover thoroughly the settled parts of Canada, is in process of formation in Montreal. It is known as the "Northern Commercial Telegraph Company," and will, it is said, be capitalized at a large amount, though those who are organizing the concern will not give the exact figures just yet. The Montreal address is at the Pelican building, that city.

Mr. Charles O. Butler, of Greensburg, Pa., at one time a member of the telegraph profession, now engaged in other business, writes to this journal that he owes his success in life to the fact that he profited by the teachings of Telegraph Age, and that his telegraphic education, in which he carefully pursued in consequence, proved a stepping stone that lifted him into a wider sphere of endeavor.

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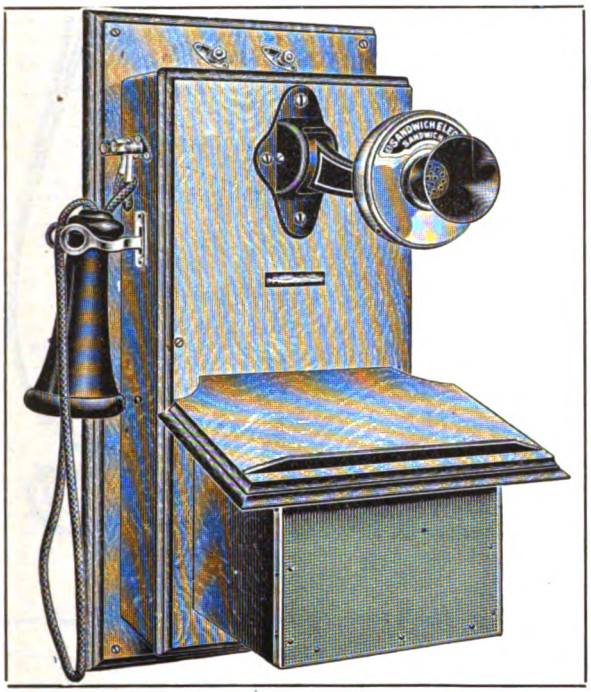
Railway Composite Apparatus



STATION TELEGRAPHONE NO. 7.
Patent Nos. 831,525
839,210
882,347

Under ordinary conditions this instrument will operate a distance of 100 miles on an iron Morse wire, and twice that distance on copper, and any reasonable number of instruments can be operated on one circuit.

Made in the following types:

Station, Caboose, Portable, Siding, Iron-box : : : :

Kindly furnish us with a diagram of the line upon which you wish such service and we will be pleased to give you the desired information.

SEND FOR OUR LATEST CATALOGUE

THE most commercially satisfactory composite telephone ever devised. All instruments equipped with the howler call and absolutely non-interfering with the Morse circuit.

Four cells of No.6 dry battery is all that is necessary for both talking and signaling, and renewals required only three or four times per year.

All caboose and portable sets equipped with jointed pole and one hundred feet of flexible cord for making connection with the line wire.

We have hundreds of these instruments on many of the largest railroads of this country and Mexico and perfect satisfaction is being obtained.

SELECTIVE CALL

Our selective calling device for telegraph offices is an entirely new innovation, operating on a reversed current; it is not continually in motion and can be operated only by the dispatcher.

Can be used on both single or metallic circuits.

Will work on the same Morse way wire with no action of mechanical parts excepting when call is being made selectively.

Has been in operation for some time on one of the largest roads in the country and without a failure.

Calls can be made individually, consecutively or in groups.

SANDWICH ELECTRIC COMPANY

SANDWICH, ILL

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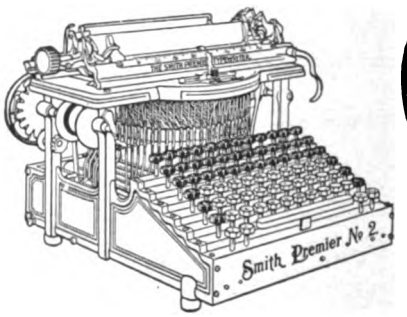

That is the surest and safest manner of handling messages. The Smith Premier writes accurately, easily and quietly, and is always equal to the amount and kind of work demanded by a busy railroad office. The favorite "mill" of the operators of America

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NEW YORK, JUNE 1, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

A System of Telegraph Pension.

A telegraph official recently in discussing the subject of the personnel of the profession to which he belongs, of the need that exists of stimulating within its ranks greater effort on the part of the individual in order to attain a higher measure of success in life than usually attends the career of a telegraph operator, advocated the adoption of a system of pension, the benefits of which to be applicable only to those persons in and above the grade of superintendent. It would be out of the question, of course, for a telegraph company to inaugurate a regular pension system covering the rank and file of its service, the multitudinous number of employes prohibits such a thought even. Moreover, were such a general proposition possible, it is doubtful, from a moral point of view, whether its adoption would be expedient, for it may well be questioned whether such a practice would act as an encouragement of diligence, of thrift and of prudence. Nevertheless, it is the exceptions that prove the rule, and accepting human nature as we find it, if a reward for merit were held out to those who should work their way upward in the service to as high a point as that of superintendent, the official who was discussing the subject said he believed that practical benefits alike to the individual and to employing interests, would be the result.

At best the telegraph service can hardly be regarded other than as furnishing a training school, excellent in its teaching, to willing minds, especially valuable for the drill it affords, the widening of acquaintance and the opportunities it offers as a means to an end—a stepping-stone to other and better paying avocations in allied forms of industry. Such a view of telegraph employment serves, and very properly so, to recommend it to the young. So regarded by the conscientious toiler a stimulous to careful work is found because of the resultant outgrowth of good that is expected to follow. If, however, men who love the profession, who desire to remain in it, and who are fired with a determined ambition to reach the top, could be assured that after attaining high office, won by merit, due to intelligence and careful preparation, that they would be provided for in their old age or in case of disability, it was thought that a reserve class of men would be developed in the telegraph whose fitness for responsible place would meet the necessities of demand. The crowning argument by the official who brought up this subject was that the need of competent men to occupy the higher executive positions in the telegraph service is clear. As time passes, this requirement, he said, will become more and more pressing. Training alone can produce a desirable official, and to such a financial guarantee, which shall sustain them through the last years of life, should not be withheld.

Place the Responsibility Where It Belongs.

The aspersions that the organized telegraphers cast upon telegraph management and service in their manifest desire to cause embarrassment to the two telegraph companies, is retroactive in its signification, for it reflects in strong measure upon the undesirability and in general the inefficiency of those who are responsible for their utterance. Bitterness due to failure has made them illogical in statement, for when the users of the telegraph are informed, for instance, that the telegraph operators of to-day are inefficient, the complaints, unconsciously, perhaps, give voice to a truism, the full force of which falls upon themselves. If it be true that inefficiency exists among the telegraphic operating forces, it cannot be the result alone of late years. Its origin must be traced backward through a long period, a period during which the organized telegraphers, who are

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now on the outside in the attitude of throwing defamation at the business that once sheltered and protected them, were receiving the pay that is earned by and accompanies employment. What then does the assertion of inefficiency mean? No other understanding can be arrived at than that the individual telegrapher himself has retrograded. The wires in use are just as good, or even better, than they ever were. The instruments on the operating room tables are more perfect. The typewriter, which makes good copy, is in universal use. Then to what is the alleged inefficiency due? The answer is a sweeping defamation of those who have taken it upon themselves to pass strictures upon the telegraph. It is, as we have frequently pointed out, because of the growing disposition in late years of the average operator to be slack in the performance of his duty; he has been lacking in enthusiasm, in the desire to "want to know," as Dr. Rheem so expressively stated it.

The spirit of unionism is responsible for much of the evil influence that has seized upon the operator. The tendency of the union is to degrade and not to elevate, and to its cruel iron hand of authority the hardships of many operators are directly traceable. The union looses sight of the fact that an incompetent operator cannot be too poorly paid. As a matter of fact he ought to be denied employment altogether. Yet the union would place the incompetent and the competent upon the same level, demanding the same pay for both. In the divine order of things extra talents were given to some and withheld from others. It is man that would force an unnatural evenness in the economy of the world, not God.

The union has spent a great deal of time and money with legislatures, both state and national, in its foolish endeavor, born of estrangement, to secure the enactment of some sort of legislation that will hit hard at the telegraph companies. The position taken is such a mistaken one, is so illogical that instead of arousing sympathy, as was hoped, the country at large and its vast interests of business, are growing weary and disgusted with the everlasting airing of grievances that do not exist in fact.

There is room for improvement in the operating departments of the telegraph, but it will not be brought about by the utterances of extravagant statements. It can only come when individual operators determine to deal honestly with themselves and with the company that employs them, by giving the best service that within them lies. Every young man should not lose sight of the fact that he has a future before him, a future with the success or failure of which he himself is the largest determining factor.

The Supreme Court of the state of New York, Justice McCall, handed down a decision, on May 22, denying the application of Attorney-General Jackson to begin suits to annul the charters of the Western Union Telegraph Company and the Postal Telegraph-Cable Company. The action was brought by the Attorney-General after the strike of the telegraph operators, on the ground that the telegraph companies were a monopoly in restraint of trade. In his decision the justice said: "A careful examination of the papers submitted herein satisfies me that there is no merit in fact or warrant in law for the permission sought, and the motion is therefore denied."

A recent decision in a so-called mental anguish case, in Texas, carried with it a fine of $500, imposed against a telegraph company because its operator accepted and transmitted a telegram written in Spanish, a language with which he was not *au fait* and so failed to grasp the meaning, and inferentially, the importance of the message. The judge, in delivering his opinion, advanced the hypothesis that operators should possess linguistic abilities, for he said that "telegraph companies should hold themselves as being ready and competent to send messages to all parts of the world in different languages, and to hold that it is a defense to an action of negligence to prove that the agent of a telegraph company did not understand the language in which the message was couched would place it in the power of such company to almost paralyze the commerce of the world by its negligence."

The commonwealth of Texas is responsible for much that is calculated legally to cause not only embarrassment but mental anguish galore to telegraph interests, for the telegraph companies are compelled to defend, it is said, three thousand suits every year in that state alone.

No Strike, Say Chicago Postal Men.

The Daily News, of Chicago, published on May 22 the following letter received from a number of operators of the Postal Telegraph-Cable Company in that city:

> We notice in your issue of yesterday an article given considerable prominence headed "Wire Men Talk Strike," etc., and, as it refers to the telegraph operators in the employ of the Postal Telegraph-Cable Company, we shall be pleased to have you give equal prominence to our statement that Wesley Russell does not represent our sentiments and has no authority to speak for us and that the matter of a walk-out or strike of the telegraph operators will be given no consideration whatsoever. In this we are voicing the unanimous sentiment of the operators employed by our company in the Chicago office.
>
> Ida Naggatz — John Ebbs
> J. J. Brosnan — E. W. Blakeley
> Carl Otto — R. A. Ditch
> H. T. Cook — F. J. Wilbee
> W. G. Washburn — Emma Hauner
> C. A. Dortmund

Telegraph Age has received many similar letters from operators in various parts of the country, repudiating the "strike talk," so called, that appears every little while in the public press, but they were sent us in confidence and not for publication. We desire to congratulate the em-

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ployes of the Postal company in Chicago for the public stand they have taken against the insinuation of disloyalty. We believe that the breach between the officers of the telegraph companies and those employes who took part in the late unpleasantness, is gradually disappearing, and we trust that the malice of the few agitators will in no wise interfere in the promotion of harmony which is essential alike to the success of employer and employe.

The International Telegraph Conference.

The International Telegraph Conference which began its sessions at Lisbon, Portugal, on May 4, is being held in the Palacio Palmella. The delegates were welcomed by an address from the Minister of Public Works, Senhor Carnet de Magalhaes, after which the Conference was presided over by the principal Portuguese delegate, Councillor Alfredo Pereira, Director-General of Posts and Telegraphs and Vice-President of the Portuguese Chamber of Deputies. The vice-presidents selected were: Councillor P. B. Cabral, of Portugal; M. Peter de Szalay, of Hungary, and Colonel E. Frey, director of the International Bureau, Berne, Switzerland. It is believed that the meeting will last from five to six weeks. After the inaugural proceedings the delegates elected four committees to deal with (1) rules and regulations, chairman, Mr. H. Babington Smith, of England; (2) rates, chairman, M. Bordelongue, of France; (3) telephones, chairman, M. Pop, of Holland; (4) drafting, chairman, M. Banneux, of Belgium. A special committe has also been appointed to consider a number of propositions relating to the revision of the St. Petersburg convention of 1875, under which all matters relating to international telegraphy are regulated. On the evening of May 4 a banquet was give in honor of the delegates, the guests numbering nearly one hundred and fifty. On May 6 the delegates were present at the interesting ceremony of oath-taking by the new King of Portugal.

Hon. Charles Page Bryan, the American Minister to Portugal, gave a reception, on May 17, to the delegates to the Conference. It was a brilliant affair.

It is stated that China will present a statement at the Conference as to the infringement of her sovereign rights regarding telegraphs in Manchuria. The matter, however, is not likely to receive a favorable hearing, as China's internal telegraphs are the worst in the world, being under divided control and without proper organization, while the charges are exorbitant.

Mr. Roland R. Dennis, the representative of the Department of Commerce and Labor of the United States, who has been attending the Conference, left Lisbon, May 23.

TELEGRAPH AGE is the only telegraphic newspaper published in America. It is up to date, covering its field thoroughly, and no telegraph official or operator can afford to be without it.

The First Telegraph Wire Operated in America.

In one of the locked alcoves of the library of Princeton University is a manuscript volume of some seventy-six pages written by Professor Joseph Henry, the famous electrical scientist, giving an account of his researches while a professor at Princeton in the chair of natural philosophy or physics. In 1848 he went to Washington to organize the Smithsonian Institution, of which he had been appointed the first secretary. In 1876, two years before his death, he was asked to write an account of his work at Princeton. This document is now in the university library.

It was across the Princeton campus that Henry strung what is said to have been the first telegraph wire ever operated in America. A year or two before he left Albany, N. Y., he had been working at his invention of the electromagnet for transmitting signals at a distance whereby dots might be made on paper and bells struck, indicating letters of the alphabet. He refused to patent this invention on the ground that it was incompatible with the dignity of science to confine the probable benefits to the use of any one individual.

In his statement he says: "I think the first actual line of telegraph using the earth as a conductor was made in the beginning of 1836. A wire was extended across the front campus from the upper story of the college library building to the philosophical hall on the other. Through this wire signals were sent from time to time from my house to my laboratory."

The operator at the other end of the line was usually Henry's wife, and the exchange of communications between the two seemed to undergraduates of those days little short of miraculous.

Portions of Professor Henry's electrical apparatus are still in the university museum, among them being his giant electromagnet nicknamed "Big Ben," by the students, for whom he constructed it. By electrical communication controlled from his house across the campus this magnet lifted or released a weight of 3,000 pounds in his laboratory.

James Wilson, superintendent of the Canadian Pacific Railway Company's Telegraph, at Vancouver, B. C., in renewing his subscription recently, took occasion to write:

"I am very much pleased with the general improvement shown in the respective issues of Telegraph Age, and would be very sorry to be without it. Should my subscription ever run behind, please do not discontinue sending the paper along. We sometimes forget the newspaper man for a time, but we do not forget to read the news contained in each number, and to act on the good advice given in the editorial columns."

Train the eye, the ear, the hands, the mind—all the faculties—in the faithful doing of your work.

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The Typewriter and Piece-Work in Telegraphy.

BY DONALD MURRAY, M.A., OF LONDON.

If some magic carpet suddenly transported a British telegraph engineer into a large New York telegraph office he would at first be dazed by the extraordinary clatter of the sounders, which are tuned up to make about four times as much noise as the British variety. The next sound to catch his attention would be the click of typewriters. He would see typewriters by dozens and scores, every operator with a typewriter, and all telegrams being typewritten. The pen used to be mightier than the sword, but there are no swords and very few pens in American telegraph offices nowadays. Every operator has his "mill," as the typewriter is familiarly called. The telegraph companies do not supply the typewriters. Each man has to furnish his own machine, and a telegraph operator without a "mill" has now no chance of employment in any of the large cities of America. The typewriter manufacturing companies make special efforts to cater for the custom of operators, and dealers in second-hand machines do an immense business among the telegraph fraternity. When an American operator is out of work and hard up he sells his typewriter to one of these agencies, or if he gets a job he hires a "mill" until such time as he is in a position to buy it.

The use of the typewriter as an ally of the Morse key and sounder is a very old story in the United States, but it was not till about 1890 that it began to come into general use, and now an operator in America is as helpless without his "mill" as a cowboy without his gun.

So far as the telegraph companies are concerned the direct pecuniary saving through the employment of the typewriter has been small, but the companies have derived various indirect benefits. The public have gained by getting clear typewritten telegrams, and the competition between the two great telegraph companies has made the use of the typewriter absolutely unavoidable. The typewriter also has resulted in considerable speeding up of telegraph work. The great gainers from the use of the typewriter, however, have been the operators themselves, and it is no doubt for that reason that the cost of providing typewriters has fallen on the operators. The increase of output by the use of a typewriter compared with a pen is nothing like so great as is generally supposed, and the real advantage of the typewriter does not lie so much in increased output as in rescue from pen slavery. The nervous strain and muscular drudgery of rapid writing is enormous compared with the same work done on a typewriter. When using the pen or pencil one group of muscles and one set of nerves have to perform a very complicated series of motions for each letter. With the typewriter, on the other hand, one simple motion of one finger is sufficient, and even this great reduction of muscular and nervous strain is again reduced eightfold by spreading the work over all the eight fingers of both hands. It is this complete release from pen servitude that has made the typewriter such a boon to telegraph operators in America, and it is surprising that telegraph operators in this country have not long ago recognized the "mill" as a friend and helper.

Roughly speaking, in America the effect of the typewriter has been to lighten the work of the receiving operator and to increase his efficiency. Operators who ranked only as second class on account of slowness or defects of penmanship have become first class. Formerly the sending operator on the Morse key could make the receiving operator "sit up." With the advent of the typewriter, however, the position is now reversed, and the receiver can take with ease all that the finest star operator can send. In America this has led to the extensive use of word contractions, and these have been standardized and published in a manual known as "Phillips Code." All good American operators use this code, and, although the sending operator can no longer make the receiving operator "sit up," the former can at least keep the latter busy even on the typewriter. Of course, contractions are employed by telegraph operators all over the world, but not to anything like the same extent as in America. Here, for instance, is an example of the way in which press messages are sent on the Morse key in the United States:

Mems o cx Cgs rptg und cv cmns o eno cap wo krp xgn ifo thr adhts wi cmb aga ay emt to t crpns, bt cujx es dtmd efo qpt peo f sq stas wi efy dmz ay osn.	Members of Congress representing under cover combinations of enormous capital who corrupt legislation in favor of their adherents will combine against any embarrassment to the corporations, but courageous and determined effort on the part of the people of the separate states will effectually demoralize any opposition.

In the first column is given the coded message, and in the second column the translation as it is typewritten by the receiving operator direct from the sounder. Of course, operators have to brush away the cobwebs from their intellects to do work of this kind, but they are very well paid for it. An American operator, writing on this subject, says: "With an intelligent sender matter of this sort can be transmitted at the rate of fifty-five words per minute with but very little effort, and, at the same time, with reduction of the strain on the receiver to a minimum."

As regards press messages, the effect of this combination of "code" sending and typewriter receiving has been remarkable. It is now not a rare thing for two first-class press operators in America, one sending "code" and one receiving on the typewriter, to handle 20,000 words of press in one night. The record is said to have been 24,000 words transmitted and received by two men in eight hours. That is roughly about twelve columns of the London Times, an aston-

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ishing feat of endurance to anyone practically acquainted with such work.

The code contractions for common phrases are works of art. Here are a few examples:

Fayib—Filed a petition in bankruptcy.
Dbf—Destroyed by fire.
Cats—Created a tremendous sensation.
Ckx—Committed suicide.
Asaph—A speculative demand with prices higher.
Bsql—Business small and quotations lower.
Herdam—Heavy receipts depress the market.
Utc—Under the circumstances.

I do not know what the rule is now, but a few years ago the telegraph companies encouraged the use of code for press work, and strictly forbade its use in handling commercial messages. As both the Western Union and the Postal telegraph companies have a large number of "bonus" circuits on which the operators are paid a halfpenny per message for all that they send over about 300 per day, and some of the records made with the Morse key, code, sounder and "mill" are surprising, especially when it is borne in mind that in American messages only the text is paid for, the address going free, and that, therefore, American messages average about thirty words compared with the British twenty; also that about half of American messages are code messages in the ordinary sense, and that, therefore, the Phillips contractions are not applicable to them. Under these circumstances a speed of forty messages an hour is quite ordinary, a speed of sixty messages an hour is regarded as very good, and eighty messages an hour have been transmitted for hours at a time.

In Canada and other new countries the typewriter is also being quite freely used in telegraphy. On the Continent of Europe there is but little scope for it, as the bulk of the traffic is handled by the Hughes, but in Russia the large telegraph offices employ dozens of typewriter girls to type up messages from the received Wheatstone slip, the Wheatstone being extensively used in Russia, owing to the immense distances covered by the telegraph network.

In conclusion, a paragraph in regard to the bonus system and typewriters from a letter written by Mr. Minor M. Davis, electrical engineer of the Postal Telegraph-Cable Company in New York, may be of interest. It is as follows:

"Replying to your questions about the bonus, or piece-work, system: A minimum, intended to represent a good day's work, is determined upon by observation. The typewriter enables a capable receiver to comfortably transcribe 'anything that comes clear,' and the stress of fast work has been shifted to the sender by that machine. Observation, checked by experience, shows that between 8 a. m. and 5.30 p. m. a good man will handle about three hundred messages on a New York-Boston circuit, three hundred and twenty-five on a New York-Philadelphia circuit, two hundred and eighty on a New York-Chicago, and so on, the allowances being made for more interruptions to the longer circuits. There is no science in the proportions; as stated the minimum is arbitrarily determined after observation. With these figures to be reached between 8 and 5.30, each operator on these piece-work circuits is allowed one cent per message for each message handled in excess of the minimum; or, if he prefers to cease work when he reaches the minimum he is excused and paid his regular salary for the full day. There are comparatively few circuits that can be operated in this manner (we have only about twenty-five of them). The increase in speed is considerable. It is not uncommon for an operator to handle a hundred messages more than the minimum, and sometimes operators handle five hundred messages in a day. I have known one or two cases where six hundred have been handled. Operators are not required to work at these very high speeds; but usually they are applicants for these circuits. It takes 'good men' to work them, and operators like to be known as capable of the work. They are required to do good, clear, accurate work, and they are held to the usual accountability for errors. Abbreviating the text (coding) is prohibited. The bonus system, like every other, fails to manage itself. There is temptation to do this, that, and the other thing that cannot be permitted; but, instead of sitting at a 'busted' wire perfectly content to do nothing, the bonus operator co-operates with the chief in making stops as few and short as possible. With proper supervision, and provided that the operator gets regular pay (minimum) that insures to him a fair income, I believe the system to be a good one for both employe and employer. Tendencies to kill the goose by overworking should be discouraged. This company certainly does not ask or wish its employes to overwork. There was no special trouble in introducing the typewriter. It makes the receiver's work easier. It brings in a few errors of its own, but, on the whole, is beneficial to the service. It has probably added something to the speed—no one knows how much; but, in message work, the chief gain is probably due to the fact that operators who are not expert with the pen can readily 'keep up' when they use a machine."—The Post Office Electrical Engineers' Journal, London.

At present there are three organizations in Japan which are directly connected with the electrical science. These are the Telegraphic Science Association, Electrical Association and Electrical Science Association. Mr. S. Kanda, a member of the former, and an authority on the telegraph, read recently an original paper at one of its meetings entitled "The Sag of a Wire Suspended at Two Points of Support at Different Levels."

This is a good time to begin a subscription to Telegraph Age, $1.50 a year.

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The Electron Theory.

BY EDWARD J. PARTRIDGE.
(In the Journal of the Franklin Institute.)

The object of this paper is to set forth the electron theory and to describe briefly its experimental foundations. The theory came into being when it was established that negative electricity is atomic in character; that a negative charge is always a whole number multiple of a definite indivisible quantity of negative electricity. The atom of negative electricity has been named an electron. The first hint that electricity is discontinuous was given by Faraday's work on electrolysis.

To show that in electrolysis equal quantities of electricity are always associated with equal numbers of atoms a monovalent element and that the ratio between the quantity of electricity passed through a solution and the number of atoms set free is twice as great for a divalent element as for a monovalent element, is to indicate that matter and electricity are similar in constitution.

But Faraday's laws of electrolysis remained for more than fifty years the only statement of fact best explained on the hypothesis of atomic electricity.

Maxwell's far-reaching theory of electricity and its immediate consequence, the electromagnetic theory of light, seemed to fasten attention upon differential equations and to cause men to be satisfied with a mathematical statement of the propagation of a disturbance and not to inquire concerning the nature of electricity. Then, too, the experimental verification by Hertz of Maxwell's theory emphasized its importance. But how unsatisfactory the theory of electricity seemed to students fifteen years ago. There was little connection between electrostatics and electrolysis, or between electrodynamics and the theory of thermocurrents, and the phenomena of vacuum tubes were but little understood.

It is in this last field that the greatest harvest of truth has been reaped. Sir William Crookes, in 1879, read a paper entitled "Radiant Matter." In that paper he described many of the phenomena caused by what we now call kathode rays. He maintained that the effects he described were due to streams of negatively electrified particles of matter that were shot off from the kathode and by their mechanical energy produced the observed effects. Crookes' view was opposed by the Continental physicists and defended by the English, with the result that the phenomena have been most thoroughly investigated in a long series of brilliant experiments. One of the side results of the work with vacuum tubes was the discovery of Röntgen rays. Finally it has been established that the properties of the kathode rays are independent of the nature of the residual gas in the tube. A kathode ray particle possesses the same mass and the same charge of negative electricity if produced in hydrogen or oxygen, carbon dioxide or helium.

The determination of the velocity and $\frac{e}{m}$; that is, the ratio of charge to mass has been accomplished by extremely ingenious experiments. One method of measuring the velocity and $\frac{e}{m}$ is to determine in the same kathode ray tube, the charge carried in a given time by the kathode rays, the heat developed by their impact, and the deflection of the stream by a magnetic field of known strength. The first of these quantities depends upon the number of particles and the charge on each; the second on the number and the mass and velocity of each; the third on the ratio of charge to mass and the velocity of each. From the equations expressing the actual relations the number of particles can be elimiated and the velocity and $\frac{e}{m}$ found. The velocity under ordinary conditions turns out to be of the order of one-tenth the velocity of light. The ratio of $\frac{e}{m}$ is about one thousand times the corresponding ratio for the hydrogen atom in electrolysis. J. J. Thomson, to whom much of this work is due, named the kathode ray particle, a corpuscle. In the interpretation of this ratio we are confronted by two possibilities, either the corpuscle is an atom of hydrogen with a charge one thousand times greater than the charge carried by the same atom in electrolysis or we are dealing with masses smaller than the hydrogen atom.

The study of radiation, and in particular of the spectra of the elements has for many years rendered familiar the notion that an atom is not an absolute unit, but is a complex, whose parts are capable of vibration within the atom. Iron, for instance, yields a spectrum consisting of hundreds of lines, every one of which corresponds to a vibration within the system that we call an atom. The electromagnetic theory of light teaches us that it is electricity that vibrates in an atom. To account for the series of doublets and triplets in many spectra, Stoney considered the atom as something like a diminutive solar system with the places of the sun and planets taken by minute electric charges. He called these charges electrons. From a consideration of the mutual perturbations of their arbital motions he formed a rational explanation of the existence of the doublets and triplets in spectra.

If the light emitted by a body is due to electrical oscillations within the atom, a magnetic field will modify the period of oscillation. Zeeman, in 1897, discovered this effect. A special line is split into two if the light-giving source is placed in a powerful magnetic field and observed along the lines of force; into three, if observed at right angles to the magnetic field. The amount of the separation produced by a field of known strength permits the

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ratio of charge to mass of the vibrating electron to be calculated. It turns out to be the same as $\frac{e}{m}$ for the kathode rays. When a single spectral line is split into two by looking along the lines of force each component of the magnetically produced doublet is circularly polarized, the circular polarization being in opposite directions. The triplet observed on looking at right angles to the lines of force is characterized by the two lateral components showing plane polarization in planes at right angles to each other, while the central component is unaffected. These polarization effects demonstrate that the lines in a spectrum are produced by vibration of negative electricity.

This is the description of the Zeeman effect in the simplest form as it had been foreseen by Larmor and Lorentz long before it was observed. In addition to this simple phenomenon many lines show a much more complicated behavior, resolving into numerous components when the source is in a powerful field. The vibration frequencies corresponding to lines in spectra have been shown to be related by a comparatively simple law and have been arranged in series. The Zeeman phenomenon is the same for all the lines belonging to the same series and for the corresponding series in related elements. In a recent paper Jean Bacquerel has shown that the absorption bands in the spectra is xenotim and tysonite are affected in a manner strictly analogous to the splitting up of the lines in emission spectra. Xenotim, a phosphorous compound of yttrium and erbium, and tysonite a flourine compound of cerium, lanthanum and didymium were selected for examination because they possess particularly narrow absorption bands. At the temperature of liquid air the bands become much sharper.

The ratio $\frac{e}{m}$ having been determined by several methods, suggests the measurement of the quantities "e" and "m" separately. Here we encounter some most interesting work.

Röntgen says, radium rays and ultra-violet light ionize air or other gases through which they pass; that is to say, they render the air conducting by forming ions. By measuring the maximum current that a given volume of the gas can carry, the quantity of electricity existing on the charged ions is found. If air saturated with water vapor is suddenly expanded it will be cooled and become supersaturated in the absence of condensation nuclei. Dust particles or gaseous ions serve equally well for condensation nuclei. If saturated air freed from dust by filtration is ionized and expanded the right amount, condensation in minute drops will take place about the negative ions only.

The size of a drop can be calculated from its rate of fall, the total amount of water condensed from the cooling by expansion. So the number of drops, hence the number of condensation nuclei follows as the quotient of the total volume of water condensed divided by the volume of a drop. Knowing the number of nuclei and the amount of electricity existing as charge on ions we have the charge on one ion. The result of the calculation is that the charge on a gaseous ion is the same as on a hydrogen atom in electrolysis. This charge is the same no matter what the gas or the ionizing agency.

The final conclusion is that the "m" in the ratio $\frac{e}{m}$ is 1/1000 of the mass of the hydrogen atom.

Hertz found that ultra violet light enabled an electric spark to jump, under conditions that otherwise would permit no spark to pass. Long study has shown that a negatively electrified metal sphere will lose the charge when illuminated by ultra-violet light. A positive charge is not affected. Investigation of this phenomenon has developed the fact that the illuminated body emits electrons and that these electrons ionize the air in the vicinity, thereby rendering it conducting. Lenard studied the magnetic deflection of a stream of photo-electrons and measured the ratio $\frac{e}{m}$. Again we find the same value. J. J. Thomson by another method also obtained practically the same result.

In a recent paper Erich Ladenburg has described experiments that demonstrate that the velocity of the projected photo-electrons depends upon the wave length of the ultra-violet light that cause the phenomenon. The velocity increases with the increase of the frequency of the light vibration. This fact adds weight to the hypothesis that the electrons are torn from atoms by electric oscillations that have periods approximately equal to the natural periods of the electrons themselves. The conclusion is plain when we remember that the greater the force retaining an electron in place the shorter would be its natural period, that is, the greater its speed of oscillation and the greater velocity would it have when separated from the atom. In other words, we are dealing with a resonance phenomenon. This view is corroborated in a remarkable manner by a consideration of the optical properties of bodies as worked out by Drude in one of his last works.

Drude was ever on the alert to seize upon any method that promised to yield a clue to the constitution of matter or to reveal a connection between chemical constitution and physical properties. In 1904, Schuster published a paper in which he gave a value for the number of free electrons in metals. Drude immediately took up the idea and greatly developed it, although his results do not agree with Schuster's. The attack proceeds from the theory of dispersion based upon the electromagnetic theory of light as worked out by Helmholtz, Drude, Planck, and Lorentz. For many transparent substances the index of refraction for a wave of given frequency is shown to depend

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upon the frequencies of the natural vibration proper to the substances. These natural frequencies in the cases of substances having so-called normal dispersion lie far in the ultro-violet or infra-red. The formulae yield the values $\frac{e}{m}$ for the vibrating matter and also the number of comparatively loosely bound electrons in the molecule.

The value of $\frac{e}{m}$ for the particles having the ultra-violet natural frequency is the same as the same ratio for the kathode rays. The value for the mass vibrating naturally at the infra-red rate shows that this mass is either a molecule or part of a molecule. In the cases of bodies that show anomalous dispersion the absorption bands are caused by the natural vibration of electrons, not of molecular masses. The importance and certainty of the method is shown by the fact that $\frac{m}{e}$ calculated from the dispersion of hydrogen is 1.5×10^7, while the rate for kathode rays, as determined by Kaufmann, Simon, and Seitz, is 1.86×18^7.

The values of the number of freely movable electrons in a metal as calculated from the optical properties vary from .5 to 7.5 per atom of metal. These numbers agree in general with values to be expected from a consideration of the thermo-electric electro-motive forces. The number of conduction electrons, as Drude calls them, in bismuth is particularly small, in antimony particularly great, agreeing with the well-known large thermo-electric electromotive force of a bismuth-antimony couple. Hagan and Rubens have measured the emissivities of a number of metals for very long wave lengths. These numbers permit a calculation of the number of free electrons per cubic centimeter; the results obtained agree well with those derived from a consideration of the optical properties of the metal.

Siertsema has calculated the ratio $\frac{e}{m}$ from the dispersion of the magnetic rotation of the plane of polarized light and obtained a value agreeing well with that reached by other methods.

The electron theory has been applied to explain the electrical properties of metals. This application has been made principally by Drude and Riecke In solid metals some of the electrons are free and move in the intermolecular spaces according to the laws that govern the motion of the molecules of gases in an enclosed space, and move with an average velocity corresponding to their mass and temperature. i. e., they participate in the motion that is the heat in the body. According to the theory as developed by Drude in its simplest form, the conduction of heat takes place by means of electrons, the molecules being constrained to vibrate about a mean position of equilibrium without collision, while the electrons have the progressive motion ascribed to molecules in the kinetic theory of gases. Electric conduction takes place in consequence of the forward motion between collisions, the forward motion being produced by a constantly acting electric force or difference of potential. The ratio between the conductivities for heat and electricity turns out to be a constant for all metals and proportional to the absolute temperature. But there are exceptions to this law of Wiedemann and Franz. These exceptions, together with the Volta contact difference of potential and thermo-electric electromotive forces compel us to assume that the number of free electrons is dependent upon temperature, and further that the positively charged residues take some part in the conduction of heat and electricity. The greater the deviation from the law of Wiedemann and Franz the greater is the part played by the positively charged atomic residues.

Since the electrons are considered as behaving like the molecules of a gas there will be a definite electronic pressure at a given temperature. Consider a piece of metal whose ends are at different temperatures. The electronic pressure must be the same throughout, therefore the density of the electrons must be less at the place of higher temperature, and we will have a difference of potential between the ends of a piece of metal. The work done by or against the electromotive force and the consequent development of absorption of heat make up the Thomson effect. Contact difference of potential is due to the establishment of equilibrium between different metals that have different numbers of electrons per cubic centimeter.

The electromotive force of a thermo-couple is made up of the electromotive force mentioned in the description of the cause of the Thomson effect and also of the contact electromotive forces of the two metals at the different temperatures. An analysis of the question shows that if the number of electrons in the two metals is independent of the temperature, the thermoelectric electromotive force is proportional to the difference in the temperature between the junctions.

(To be continued.)

The Korean Telegraph.

The telegraph business of Korea, as reported by Consul-General Thomas Sammons, of Seoul, is increasing, although the number of telegrams sent abroad, not including those to Manchuria, shows a decrease following the abnormal activity during the period immediately after the war. The telegraph lines aggregate 6,772 miles. American telegraph instruments are not generally used.

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Memphis as a Telegraph Center.

BY J. B. DILLON.
(Chief Operator, Western Union Telegraph Company, Memphis.)

As a telegraph center the city of Memphis, Tenn., has attained a position of much importance. During the last decade, especially, the city has grown rapidly in population, and its business development has expanded in corresponding manner. Increased demands upon the telegraph service have naturally followed such progress, and the amount of traffic handled in consequence has reached very large proportions. Outward physical proof of this is shown in the fine edifices that house telegraph interests, the large operating forces employed and in the very general excellence and extent of modern equipment that has been installed in order to meet the requirements of the situation.

The statement of a few specific facts relative to the standing of the city as a center of business activity will be interesting and instructive regarded in its bearings on the telegraph. In the first place it may be remarked, that Memphis has advanced to the enviable distinction of being the largest inland cotton market in the world. Not only this, but it ranks as the largest hardwood, and the second largest lumber market in the world. Its manufacturing interests are varied and extensive, and the city is closely bound to the rest of the country by eleven trunk lines of railroad which converge at this point. The volume of business transacted at Memphis for the fiscal year 1906-07, amounted to $425,000,000, while the bank clearings totalled $248,098,315, the amount of money on deposit exceeding $30,000,000. The fact that Memphis supports eight exchanges and business organizations of one kind and another, further attests its commercial greatness. The city is now estimated to contain a population closely approximating 200,000, although in 1900 the federal census gave it 102,320.

All this is mentioned simply by way of introduction, for it reveals the magnitude and financial strength of a mid-country point, of comparative recent development, admirably located for all purposes of trade, and about which too little information in particular has gone abroad.

The main office of the Western Union Telegraph Company at this thriving city on the Mississippi River, is located in the Cotton Exchange Building, at the intersection of Madison avenue and Second street, the business heart of the town. This is an architecturally attractive structure, built of red pressed brick, five stories in height. The receiving department on the street level, ample in its proportions, is finished in oak, the public floor being laid in white tiling, in which the letters W. U. Tel. Co. appear worked in blue tile. The operating room occupies nearly all of the top floor. Space is provided for 770 jars of E. S. type of storage battery chloride accumulator.

The receiving and operating departments are connected by tubes, through which the messages are conveyed.

The Cotton Exchange is located on the second floor of the building, directly above the business office of the telegraph company. Henry Hotter is the secretary of the exchange, which numbers among its membership some of the brightest cotton dealers in the country. There is a branch telegraph office on the floor of the exchange which is connected by direct wires with the New York and New Orleans Cotton Exchanges, between which a one-minute service is maintained. C. C. De Lany is the manager of this office.

On the same floor with the Cotton Exchange is also located the Memphis Merchants' Exchange, of which N. S. Graves, an old-time telegraph operator, is secretary. This exchange has also direct wire connections with Chicago and St. Louis, from which points stock, grain and provision quotations are constantly received.

The manager of the Western Union Telegraph Company at Memphis, is E. T. Moore, a picture and sketch of whom appeared in the March 1 issue of TELEGRAPH AGE. J. C. Young is the cashier, C. C. Cornell, collector; Miss Pearl Oberkamp, receiving clerk; R. McElroy, delivery clerk; Miss Jennie Matthews, bookkeeper; Miss Ida Kohnman, stenographer, while Miss Gaynell O'Brien has charge of the service messages. The Tennessee District Telegraph Company performs an excellent service, under the management of G. Soderstrom.

In the operating room J. B. Dillon is chief operator, B. A. Harris holding the dual position of assistant chief operator and wire chief; R. E. Griffey is assistant wire chief; J. H. Oswald, repeater chief; C. T. Raymond, traffic chief, and G. A. Bishoff, assistant traffic chief. Besides these the normal force of operators numbers sixty.

Memphis is looked upon as the gateway, telegraphically speaking, to the Southwest. It is an important repeater point, for all St. Louis-New Orleans, Chicago-New Orleans, Kansas City-New Orleans, Dallas-New York circuits, and one of the Dallas-St. Louis circuits, are repeatered here. The Memphis-New Orleans circuit is considered one of the best working trunk lines in the country. The route followed is over that of the Illinois Central Railroad, of which line Superintendent of Telegraph, G. H. Groce, of Chicago, who co-operates closely in all things necessary to excellence of maintenance, etc., with Superintendent J. R. Terhune, of the Western Union Telegraph Company, at Nashville. The assistant superintendent of telegraph of the Illinois Central, B. Weeks, has his headquarters at Memphis.

The day report of The Associated Press for the entire State of Texas is sent out from this office; the night report being made up and sent out from their own office for the same state, and which is in charge of Thomas A. Ashcroft, a gentleman who has had an extensive experience in press association work in New York and Chicago, as well as at this point.

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Within the limits of the business section all telegraph and telephone wires are placed underground.

The ticker service, under the supervision of W. R. Thomas, is a feature of the telegraph at Memphis, especially in transmitting cotton quotations. The installations include about forty instruments.

As the facilities of this office have practically doubled in the past fifteen years and the town has also doubled in size within the same period, it is not difficult to predict that the next fifteen years will likewise witness corresponding growth of population and multiplex business interests. Memphis has a bright future.

Success Through Failure.

Many of our most successful men of to-day owe their success to their first failure, says "Spare Moments." This may sound strange, yet every word of it is true. Their first failure taught them the lesson which they later in life applied so successfully that failure was never again to come to them. It taught them prudence, forethought and deliberation—three of the essentials to success.

It is an old saying that a dollar lost is often a dollars made. The man who profits by failure, who is richer by the lesson learned from failure, is the one to whom when success comes it comes in generous measure.

You lose a dollar in a business venture and you have learned a dollar's worth of experience; this experience makes you careful, you look ahead, you investigate and from that loss you have drawn out again. Every man who has attained wealth and position through his own hard work and skill will tell you that wealth and position has not come to him without failures in the outset. He has perhaps forfeited his first thousand before his second, third or fourth thousand has come into his hands.

Jay Gould once told a young man who asked him how to become rich that he should fail at least once. But, added Gould, "Fail in everything but your courage. Do not become discouraged." Old John Jacob Astor once said, "I lost my first thousand dollars, but that loss made me wealthy. I learned to look at a thing hard and long before I placed my hand upon it."

Some men wait for other men to try a thing, to take the step, before they will venture out themselves. They say, "Let the other man fail or succeed, I'll then know what to do." But one man seldom profits by the lesson taught another man, the lesson must be learned by himself. A dozen men may fail and the thirteenth succeed, men say, and so man seldom profits by the "letting the other man try" theory.

But it takes a courageous man to meet failure. To lose the first hard-earned dollar and not see a hope of another one coming to take its place, will dishearten and daunt anyone but a courageous man. Few men can stand the first failure—it is often their final failure. They never try to do anything, never make another attempt. A second venture, and the lesson taught them by failure instead of preparing them for further trial, simply leaves them discouraged and ofttimes makes of their lives greater failures than the failure wrought to the business has done to invested capital or years of toil and struggle.

It is, too, a strange thing that greatest successes in many men's lives have followed the most seemingly crushing failures. But in all these instances the man who has failed has not permitted discouragement to take too firm a hold on him. He has studied lessons taught him by the failures, and enriched by them he has started out again, worked upon the ashes, so to speak, built upon the ruins of his failure what is to become his gigantic success. He has looked upon his failure as the earth from which he is to take out the ore of success.

If you fail, do not give up. Study the causes of your failure. See wherein your weak and assailable points were, and with courage and determination as your only capital, start out again. You have learned a lesson. Failure has taught you a lot success might never have taught you. It has perhaps taught you one great thing; whether or not you have the courage in you to stand failure, whether you are brave or cowardly—afraid to try again or fearlessly ready to start over again. Failure never comes without bringing its pains and pangs, its sighs and moans. It is hard to stand, hard to live through, but there is in every failure something still left that if we will but study, but consider, we shall find of value to us. It is the lesson taught, the knowledge imparted to us, the experience learned by us. We are better prepared for the second venture. We have learned to know what are the great keys to success. We have been taught prudence, forethought and deliberation; with these three we can often unlock the door to the chamber wherein is stored the chests of gold, the volumes of learning, and the ladder that we must have in order to ascend to the hall of fame. Consider then what your first failure may be able to do for you and then you may look upon it as a successful failure.

International Conference on Electrical Units and Standards.

The International Conference on Electrical Units and Standards will meet in London, England, in the fall. A committee consisting of G. R. Askwith, K.C.; Sir John Gavey, C.B.; Dr. R. T. Glazebrook, F.R.S.; Major P. A. MacMahon, F.R.S.; Major W. A. J. O'Meara, R.E., C.M.G., and A. P. Trotter, has been appointed to prepare a program for the consideration of the delegates. This committee will also make arrangements for the reception and assembly of the delegates attending the conference. Mr. M. J. Collins, of the Board of Trade, will act as secretary to the committee.

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The Havana Office of the Commercial Cable Company of Cuba.

The office of the Commercial Cable Company of Cuba, at Havana, Cuba, an illustration of which is shown herewith, is located at the corner of Mercaderes and Obrapia streets, the center of the business district of that city. The superintendent of the company at that point is J. W. Lawson. Prior to his appointment to this position, in September, 1907, he was supervisor of traffic of the Commercial Cable Company at Canso, N. S. The Havana office, which is but a short distance from the water front, is connected with the submarine cable by an underground Okonite cable, leading under the streets of the city. This station works direct with the Commercial Cable Company's central office at No. 20 Broad street, New York, with which an excellent service is maintained. The cable is about fifteen hundred miles in length, and the siphon recorders are the instruments in use.

THE HAVANA OFFICE OF THE COMMERCIAL CABLE COMPANY OF CUBA.

The United States Military Telegraph Corps.

The continued illness of James E. Pettit, secretary and treasurer of the Society of the United States Military Telegraph Corps, and who is the chief operator of the Postal Telegraph-Cable Company, at Chicago, caused that gentleman to feel obliged to resign his official position in the telegraph corps. William Bender Wilson, the president of the Society, has accordingly issued the following circular addressed to comrades:

After twenty-six years of faithful, self-sacrificing service in the interests of this society, performed in the most cheerful and loving manner, Mr. James E. Pettit, our secretary and treasurer, has been compelled to resign his office by reason of impaired health. This necessity I know will be heard by you with profound regret.

To fill the vacancy caused by Mr. Pettit's resignation I have appointed Mr. David Homer Bates, of 658 Broadway, New York, who has consented to serve until our next annual meeting. You will kindly recognize Mr. Bates in all official communications. We all know him as one of the most devoted and distinguished of our members and appreciate his consenting to assume the position.

Members of the society who have not received their certificates of honorable service under the **act of** January 26, 1897, should write to the Secretary of War, Washington, D.C., for necessary application blanks.

In all cases where members of the corps have changed their postoffice addresses since they last communicated with the secretary's office, they should send their new address to Mr. Bates.

Profound sympathy is expressed on all sides for Mr. Pettit because of his illness, a sympathy that will follow him in his retirement. His warm-hearted personality and long-continued service in behalf of his military comrades, expressed in his devotion to society interests, which he so zealously guarded, have endeared him to a wide circle of friends.

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progressive operator; $1.50 a year.

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How Municipal Ownership Installs Telephones in Australia.

(Reprinted from an Australian newspaper.)

Numbers of householders who are desirous of installing a telephone are deterred by ignorance of the departmental regulations and the fear of red tape. The procedure is really so simple that a few notes, forestalling the efforts of the proposed post-office publicity department, may prove of interest to intending subscribers.

The first step is to write to the deputy Postmaster-General, stating the position of the premises, and asking particulars of fees payable. By return post you will receive a printed card (Form XO, 982) stating that your letter has been duly received and is having attention. This card is sent by the office boy, and has no real bearing on the subsequent proceedings.

After this effort the department takes a brief rest to recover its strength, and then plunges into a series of abstruse calculations over a period of some weeks. The result of this mountain in labor is an absurdly inadequate mouse, in the shape of a circular (Form CB, 67), informing you that your telephone will cost you five pounds per annum for a maximum of 2,000 originating calls. If this startling example of departmental omniscience does not overpower you you may write to the D. P. M. G., accepting this offer, and instructing him to proceed with the work.

Within ten days, or thereabouts, you will receive another circular (Form C, 1,546), requesting you to sign the attached agreement and pay twelve months' rent in advance. Having done this you may safely take a holiday.

After an interval of, say, a month, it is as well to write to the D. P. M. G., pointing out that you have only a lease of the premises, and are, therefore, anxious to have the telephone as soon as convenient. You will receive no reply to this (Form XY, 1,273, being out of print), but a few weeks later a very civil-spoken young man will present a half-gallon "billy" at your back door, and request a little hot water for breakfast. If you direct attention to the size of the billy the man will point out two of his mates who are sitting on your roof and two others standing in an expectant attitude in your back garden, a sixth man will be found standing at the head of a lineman's hand-cart out in the right of way. The men on the roof are discussing where they will fix your telephone wire, while the men in the garden are waiting to catch them in case they roll off.

If the weather keeps fine the necessary wires will soon be connected, and nothing then remains but to obtain the telephone instrument. After waiting, say, two or three weeks without result, you should write to the daily papers, directing attention to the facts, and signing yourself "Disgusted Taxpayer." On the day following the insertion of your letter the "official explanation" (Form XO, 73) will appear in a prominent position in the news columns. The explanation will set out that the postal department is not to blame, since it ordered seven telephone instruments in 1904, but the demand has been so great that these have already been used. It will further explain that tenders are being called for ten additional instruments, and arrangements are being made for prompt delivery. Again, it will state that all applications are dealt with strictly in order of priority, and as soon as the 1,196 back orders are completed "Disgusted Taxpayer's" application will receive immediate consideration.

The same day's evening paper will contain an interview with the minister concerned, who will express regret that "Disgusted Taxpayer" did not write direct to the department under his own name. The minister will add that he is completely reorganizing the department, and, although only nine months in office, he has already had two telegraph poles repainted and a piece of orange peel picked off the steps of the G. P. O. The interview will conclude with a statement that the minister has "called for a report." This is a most arduous and dangerous undertaking, which cannot be safely attempted by anyone drawing less than £2,000 a year, with prospects of £200 increase.

As the result of the publicity given to your case by the press, a telephone instrument will be sent out to your house, and you must then act with utmost circumspection if you would avoid disaster. Foolish people with no knowledge of departmental methods are apt to directly address the instrument-fitter, saying: "I want the telephone placed here in the hall." This, however, is a fatal mistake. The best way is to suggest, with due diffidence, that the telephone should be placed under the kitchen sink. The fitter will say that is impossible and express his intention of putting it over the drawing-room mantelpiece. At this stage, with a little tact and a violently expressed preference for the sink, you will succeed in having the instrument set up in the hall, where you wanted it.

Your troubles are now over, and at the modest charge of £5 per annum, in advance, you have a piece of furniture, which is an ornament to any house. In the event of your ever desiring to use your new telephone, you should first read the instructions most carefully, and, if you are connected to a suburban exchange, it is always as well to drop a postcard to the manager the day before you ring up. Attention to this little point will insure the prompt attendance of an operator when you do ring, and you will then learn without unnecessary loss of time that the number you want is engaged.

Three months, or thereabouts, after the telephone is installed your name (incorrectly spelled and with someone else's initials) will be duly inserted in the official "Telephone Directory," and earth will hold no further joys in store. It will be seen from this that installing a telephone is a perfectly simple operation, and, if due regard is paid to the hints here given, the whole thing can be fixed up within the year.

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The English Marconi Wireless Telegraph Company Announces Change of Policy.

In the annual report of the Marconi Wireless Telegraph Company, considered at a recent meeting held in London, the presiding officer, Sir Charles Euan Smith, referred at length to the changes in company policy. He said in part:

"The policy that I have endeavored to explain, as far as possible, of letting bygones be bygones and of turning our attention to the possibilities of the future is dealt with in the paragraph headed 'inter-communication.' At the time of the last Conference in Berlin, and for many months afterwards, your board undoubtedly felt themselves aggrieved as to the action taken under the direction of His Majesty's government in regard to the Conference, and their acceptance of the principles of international communication, and, in consequence, prompted by sincere conviction our policy for a long time was to endeavor to impress on the various government departments the injury which we considered this acceptance by the government had done and was doing to public interests, in addition to the prejudice that we, ourselves, had received therefrom. The persistence with which we endeavored to gain from the authorities concerned, their adherence to the view which we put before them, was pushed to a point at which it became evident to us that it must cease. We made no practical progress in gaining any adherence to the policy which we wished to see prevail, and the great majority of the directors on the board arrived at a given period, at a decision that this policy should now cease, and that we should no longer maintain an attitude of opposition to the government departments, which had this one single and fatal defect—that stopped all business in connection with them, was very expensive, and in the end was becoming highly prejudicial to the best interests of the company. This was very much the case, also, with Lloyd's. The board, therefore, considered it was in the company's best interests to notify the government that whatever their own convictions might have been, they wished to adopt a course of action that would place them more a rapprochement with the government departments, lead to detente of the strained relations, and lay the ground for substantial and profitable results. This change, which took place in February last, after prolonged consideration, has been productive of promising results. We have indicated to the Postmaster-General our acceptance, under certain provisoes, of the principle of intercommunication, and the post office, on their side, have acquiesced in and promised their most favorable consideration and support to, several very important matters which we consider as material to our welfare, and which, as I believe we shall now receive the support of the post office, the Colonial Office, and the Admiralty, is thus securing compensating sources of revenue, and laying still more firmly the foundation of our future prosperity. The Foreign Office has also recently accorded us their support in a matter of great importance in a foreign country, which has secured for us another most promising field of action. These facts, taken in conjunction with the recommendations made by the select committee, as published in the report, acknowledge our right to be pioneers of practical wireless telegraphy, and recommend generous treatment, and place us, as we may well hope, in a strong position with the government. We trust that our shareholders will approve of what has been done in this matter of policy. Fighting is an excellent thing, as long as one fights for some purpose, but to continue running one's head against a brick wall cannot, from any point of view, be considered a wise permanent policy. I may add that the general terms in which I have just intimated the friendly intentions of the post office have been embodied in a letter from the Postmaster-General, which lays down in so many words, his willingness at once to enter upon a favorable consideration of many of the points which we submitted for consideration.

"As to our general progress throughout the world, we are now securing profitable business all over the face of the globe. America, Canada, South America, France, Italy, Russia, Belgium and China all come to us for apparatus and installations, and we feel from the very nature of the business that the field is almost limitless in its profitable opportunities. Indeed, the board is convinced that within a short time the adoption of a system of wireless communication will become obligatory on every recognized state or nation. As we believe our system to be the best, we are sure that we shall secure at least a large proportion of business offered. Our manufacturing station at Dalston is splendidly equipped and designed to meet all foreseen demands, and our training school for teaching wireless telegraphy is accomplishing all that we hoped for when it was first installed. In Paris, since the beginning of the year 1907, a receiving office had been opened at the headquarters of La Compagnie François Maritime et Coloniale de Telegraphic sans Fil, 35, Boulevard des Capucines, where messages can be handed in for transmission by wireless telegraphy to passengers on board such ships at sea as may be fitted with our apparatus. The French company accepts these telegrams and transmits them to their destination, whether for a short or long distance, by means of the coast stations which the Marconi Wireless Company has established in England, Canada and the United States. This arrangement is one of considerable public utility, and is much appreciated by the French public, as the number of messages handed in and paid for shows a continuous and encouraging increase. As to Lloyd's, our relations with this great association have now been placed on so satisfactory a footing that we hope to avoid, in the future, the litigation that has been not infrequent in the past. We trust, if possible, by friendly communication, to settle any points about which we

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may differ. I need not tell you that as regards Trinity House and the Board of Trade, we trust that the installations of our system on the Trinity Lightships which is there reported, may, and should receive great expansion. We think that nothing could be more useful on a lightship than the Marconi apparatus which can deal so instantaneously and effectively between shore and ship. Mr. Marconi, who is possessed of high abilities as a business man, in addition to his scientific attainments, offered, until a suitable business manager had been found, to carry on the management of the company in addition to his own scientific work, in succession to Mr. Cuthbert Hall. So far, he has been singularly successful, and since his assumption of office has succeeded in effecting considerable economies in the administrative staff. It is not, of course, intended for one moment that Mr. Marconi should be permanently burdened with the conduct of the ordinary business details, as his assistance is most needed in the scientific supervision of the affairs of the company. As soon as a suitable business manager can be found, he will be relieved of his duties as managing director. I am glad to be able to announce that he has signed a fresh agreement with the company whereby we have secured his services as technical adviser for a further period of three years."

Railway Signal Association and the Care of Storage Batteries.

At the May meeting of the Railway Signal Association, held in New York, in discussing the question of storage battery cells, it was the consensus of opinion that storage battery cells should be arranged on the racks transversely instead of longitudinally, as is the practice among users of the storage battery in other than signal work.

A paper on the care of storage batteries was submitted by H. M. Beck. The speaker dealt chiefly with the restoration of low cells. He said in part, as reported in the Railroad Gazette:

"The care of a storage battery should have for its object the prevention of low cells, rather than their treatment. The most economical method is to make the expenditure required for the proper care and operation of the cells and this is absolutely essential, if satisfactory results are to be obtained. The tendency is just the reverse: to allow the cells to run as long as possible with little or no attention, and it has frequently required a costly experience to bring about the needed reforms. While the causes of low cells may be varied, the result produced and consequently the treatment required, is not so varied, being in fact, comparatively simple. The general procedure is as follows: (1) Restore the cell mechanically; (2) renew the electrolyte if there is any question as to its purity; (3) restore the cell electrically by charging; (4) determine, if possible, the cause of the trouble. The mechanical restoration covers the operation of examining the cell and putting it back into its original condition mechanically. If the electrolyte were renewed in every case the expense would not be great in the small cells used in signal service and this operation would then be purely mechanical. The electrical restoration has been probably the greatest stumbling block, but it consists in simply charging the cell until a maximum voltage and gravity is reached. The determination of the cause of the trouble is sometimes difficult, but fortunately it is not one of the essentials, and is chiefly of value in preventing a recurrence of the trouble. Thus reduced to its essential elements, the treatment of low cells consists simply of a mechanical overhauling followed by a prolonged charge, and should not be difficult for anyone to grasp. Mr. Beck then gave a very thorough, detailed and clear statement of the troubles encountered in the management of accumulators, due to short circuits, sediment, worn plates, lack of care, impurities in the electrolyte, sulphating, lack of ventilation, and every other possible cause, and told in simple and forcible language how to deal with each; and closed as he began, with the three essential points: Restore the cell mechanically, renew the electrolyte if its purity is questioned, charge to a maximum. In many cases the storing charge is all that will be found necessary."

Mr. Yocum, of the Philadelphia and Reading road, for the committee on storage batteries, presented a printed report consisting of a carefully prepared and detailed description of the storage battery, with rules for installation and care. One of the rules proposed was that every two weeks storage batteries should be overcharged for about one hour. This provoked discussion, as some batteries in places not conveniently reached and not much used are overcharged far less frequently than this. Mr. Stevens, of the Atchison, Topeka and Santa Fe road, overcharges his batteries every sixth charge, no attention being paid to the number of weeks elapsed. The prevailing opinion was that a rule like this—for overcharging on one of a given number of occasions would be satisfactory, and that a time limit was not necessary.

Municipal Electricians.

The annual convention of the International Association of Municipal Electricians will be held at Detroit, Mich., August 19, 20 and 21. Mr. Frank P. Foster, of Corning, N. Y., the secretary, will be glad to answer any inquiries requiring information in regard to this meeting.

A patent, No. 886,624, for an automatic fire alarm, has been granted to William Tom Munro, of East Blairlinn, Cumberland, Scotland. Has two vessels filled with gas, one at a higher pressure than the other. One of the vessels is more easily affected by heat than the other, whereby a gradual change of temperature has no effect, but a sudden change of temperature causes an alarm circuit to be closed.

Telegraph Age is headquarters for electrical and telegraph books. Write for catalogue.

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The Military Telegrapher in the Civil War.

PART FOUR.

As a military telegraph operator, James E. Pettit was one of the most expert, and rendered highly efficient service in the field during the Civil War. Born in March, 1842, he was but nineteen years of age at the date of his first enlistment. His subsequent identity with the military telegraphers took a practical turn, inasmuch as for many years he held the post of secretary of the Society of the United States Military Telegraph Corps, only lately resigning from that office on account of ill-health. He is now and has been ever since the Postal Telegraph-Cable Company established an office in Chicago, the chief operator of that company at that point. He tells the story of the part he played in the military telegraph service in a letter dated at Chicago, July 8, 1878,, and addressed to Colonel William R. Plum, of Lombard, Ill., the historian of the work, recounting the deeds of the military telegraphers. Mr. Pettit's letter in part is as follows:

"Although I had seen active service as a soldier in the field, dating from the first outbreak of the Civil War, for I enlisted in April, 1861, I subsequently returned to civil life, and in 1862 was engaged at my old occupation as a telegraph operator, first at Kenosha, Wis., and afterwards at Council Bluffs, Iowa. But I was anxious to return to the army, and in the following year, 1863, I was appointed clerk in the quartermaster's office in the army of the frontier under General Frank Herron, headquarters in the field, Missouri. In June we were ordered to Vicksburg, and during the siege of that place I ate blackberries and figured vouchers. After the siege I left the quartermaster's service to take charge of the Athens, Ala., telegraph office as military telegraph operator under Captain John C. Van Duzer. Athens was then the frontier post, and end of the line originally running from Nashville to Decatur, and which later was extended to Stephenson, Ala. While there I was driven out once by the Confederate General Roddy, but providentially lost nothing of my effects. At another time the rebel General Wheeler was enabled to pass around us with 2,000 cavalry, but we were too strongly posted for him to disturb, but later, when General Forrest, while acting as a feeler for Hood's advance on Nashville, swooped down upon us, he succeeded in taking us in. The whole force located at Athens was captured, September 24, 1864, including, beside myself, John F. Ludwig, of Laporte, Ind., who is now (1878) manager of the Western Union office at Burlington, Iowa., but who at the time referred to was acting as my assistant. We were taken to Meridian, Miss., where we were confined in the stockade for a while, thence transferred to Selma, Ala., and finally to Cahaba, Ala., where we remained prisoners until March 14, 1864.

"During this time I was ill with typhoid fever for about two months in the rebel hospital. Mr. Ludwig was also ill at the same time and was in the same ward with me. Our prison consisted of an old cotton shed, which was minus one-half of the roof which had been blown off by a gale. This dilapidated old structure was located on the banks of the Alabama River. Within its contracted quarters there were some 2,800 prisoners. I convalesced sufficiently to be able to return to the prison on January 14. The unexampled rains of that season caused the river to overflow its banks, the water running over the prison floor, covering it to a considerable depth. Notwithstanding this condition of things, so prejudicial to human health, we were compelled to remain within the building and adapt ourselves to our surroundings as best we might. We managed to secure some of the cordwood that came floating down the river, and with this we built rude platforms which afforded us at least a dry sleeping place, the regular bunks providing accommodations only for about eight hundred men. The water continued in the prison for over eight days, and when it finally subsided a vast amount of filth remained deposited upon the mud floors.

"As might have been expected, this experience, in my weak state of health, told severely upon me, and when we left the prison, March 14, and arrived at Big Black River bridge, back of Vicksburg, on March 21, after being paroled, I felt pretty shaky. I was placed on the parole line running from Vicksburg to the Big Black River in charge of the office at the rebel headquarters. This line was put in shape merely for the facilitating of the exchange of prisoners. While here I exposed myself too freely to the weather and had a relapse of my prison fever. To this circumstance, regarded almost as an anomaly, must I attribute the preservation of my life, for had I been well enough to have undertaken the trip I should have been a passenger on the ill-fated steamer Sultana, whose boilers exploded at Memphis, causing the death of a vast number. I was not exchanged until the eleventh day of May, 1865, having been a prisoner of war for the period of seven months and seventeen days. I went home to Kenosha, Wis., to recuperate. A month of rest restored me to health and strength, and I returned to Athens, Ala., where I remained as railroad agent, military cipher operator and express agent for some eighteen months, when, the war being ended, the railroad was turned over to the civil authorities. At this time, with all the events of the war still so fresh in mind, mingled with a certain amount of bitterness, wholly natural under the circumstances, I was unwilling to continue in an employ that I might have retained, and therefore gladly obeyed an order to go to Augusta, Ga., as cipher operator. This duty was performed under Captain J. R. Gilmore. At the end of nine months of this work my services as a United States military telegrapher were concluded, September, 1866, and I returned North. The cipher book I used at this point was the new No. 7, the former one, No. 1, was captured when I was taken prisoner at Athens. This in substance con-

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cludes a brief outline of my connection with the military telegraph service during the Civil War.

"I might relate many incidents of the war that came under my individual observation, frequently to which I was a party. Many were pathetic in the extreme, and some partook of the humorous. This leads me to remark that I had saved the pants I was captured in, the same I had bought from Platt Burr, then chief operator of the line located at Athens, and for these I was offered the munificent sum of $2,000 in Confederate money on my return to our lines. I kept the pants.

"A short time before my capture, I remember it was a rainy day, General Grenville M. Dodge, then in command of the fourteenth corps, came into the office with a very important despatch addressed to General Veach at Memphis, directing that officer to return to Memphis with his column of men, a force aggregating some 4,000. It was deemed of such importance that no time was to be lost in reducing it to cipher. I called up "N," the call for Nashville, and started in. Before I was three-quarters through, I think I must have been broken by the receiving operator at least some fifteen or twenty times. I knew that no such talent was employed in that office. So I stopped sending, and, calling "N" again, I asked "134" who I was talking to. The answer came, "C." I supposed it was Cass Sholes. I then sent the message rapidly and received a prompt O. K. After my capture I met at Cherokee station the operator who figured in this incident. I think his name was Fowler. He belonged to the rebel General Wheeler's division. He told me he was standing on the railroad track with a tap in my wire and an old relay to his ear. He said he received enough of the message to get the general run of its contents, but that when I whooped it up to Nashville, it was all Greek to him. I also met William Ord, General Forrest's operator at the same place."

Beginning with the issue of June 5 the Railroad Gazette, of New York, and The Railway Age, of Chicago, will be issued as a single, combined periodical under the name Railroad Age Gazette. Offices will be maintained in both cities. This combination merges papers that have had a long existence and made an indelible impress on railroad journalism in this country. The unified paper will show a strong advance upon anything of the kind that has ever gone before. The Railway Gazette was founded in 1856, and The Railway Age in 1876.

A safety device for handling train orders has been invented and patented by W. R. Scott, assistant general manager of the Southern Pacific, at San Francisco, and E. M. Cutting, supervisor of signals of the Western division, of which Mr. Scott was formerly superintendent. The purpose of the invention is to keep operators from forgetting to deliver orders to trains, and this purpose is carried out by locking up the orders and blanks so that the operator cannot get a blank to use for making an order until his signals are displayed in the stop position.

Notwithstanding the decision by the New York Central Railroad to close its telegraph school at Albany, as announced in our issue of May 16, the company has decided upon its further continuance, its closing at this time being deemed inadvisable. Excellent educational work was accomplished at this school which has been conducted under the direction of Mr. C. A. Wood. Mr. Wood having been assigned elsewhere in the company's employ, Mr. Harry Rector has been selected as the new instructor, being transferred from one of the executive departments. He was formerly employed for several years as an operator on the Mohawk division.

Chinese Telegraph Lines.

Consul-General James W. Ragsdale, of Tientsin, submits the following information with reference to the Imperial Chinese telegraph lines, gathered from reports recently published:

At the end of 1906 the administration had a system of 22,419 miles of telegraph lines, with 34,473 miles of wires and a submarine cable of 946 miles; 379 offices, of which 62 were open for day and night service, and 317 for day service only. The number of instruments in actual use was 768. The staff of the head office in Shanghai numbered 67 and the general staff 3,175, while inspectors, linemen, etc., totaled 2,400. In addition there are many provincial lines, usually constructed by the administration, but worked and managed independently by the provincial authorities.

The telegraph companies having connections with China are the Great Northern, Eastern Extension, German, Dutch, and Commercial Pacific, while the French cable connects Touraine with Amoy, a German cable Shanghai with Kiachow and Chefoo, and a third cable, partly Chinese, Chefoo with Port Arthur. China also has frontier connections with Burma, Indo-China and Russian Siberia.

The Court of Appeal at Mombasa, Africa, which heard the appeal of the five natives sentenced to death for the murder of Tom London, who was the telegraph engineer of the cable steamer Colonia, has confirmed the sentence on four of the prisoners, and has altered the sentence on the fifth prisoner to ten years' improsonment. It will be remembered that Mr. London went back into the interior for a brief hunting expedition, from which he never returned, having been waylaid and killed.

Mr. J. R. Yelvington, manager of the Western Union Telegraph Company, at De Land, Fla., a new subscriber to Telegraph Age, says: "I can say that I have found many interesting subjects in the two copies I have thus far received."

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ABERNETHY, J. P.—The Modern Service of Commercial and Railway Telegraphy, in Theory and Practice, including the Railway Station and Express Service; arranged in Questions and Answers; $2.00.

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Book Review.

"Telegraphic Systems," by Arthur Crotch (J. B. Lippincott and Company, Philadelphia, 270 pp., 222 illustrations), a member of the engineer-in-chief's department of the British telegraphs, adds another volume to the works of this author, those preceding it being "Elementary Telegraphy and Telephony," "Telegraph Secondary Cell Installations" and "The Hughes and Baudot Telegraphs." In the present volume the author deals with his subject in the same plain and lucid manner that has marked his previous efforts. His aim has been to give a plain and concise description of the main systems in use in practical telegraphy. In the fourteen chapters comprised within the book, full consideration is given of batteries—primary and secondary; of universal battery working, duplex, diplex, quadruplex, automatic and multiplex telegraphy; the Hughes type-printing instrument, the Baudot system and the Murray type-printing telegraph are reviewed; there are also chapters on test and battery boxes, circuit concentration, repeaters, and submarine telegraphy, the closing chapter being devoted to wireless telegraphy. The volume is carefully indexed, is printed on good paper, the illustrations are well drawn, and the various subdivisions of a great subject are clearly presented. The price of the book is $2, and it will be sent to any address, carrying charges prepaid, on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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Longitude by Wireless.

One of the most interesting propositions for the practical utilization of wireless telegraphy is its use for determining longitude at sea, says the Electrical World. A French commission, headed by M. Poincaré, is now investigating the project which, on its face, looks practicable and valuable. The finding of longitude is and always has been, a very troublesome matter. Practically it amounts to finding at any point the local time and comparing it with standard meridian time carried by the ships' chronometers. In clear weather on land this is a very easy matter, indeed, but at sea with no fixed instruments it is troublesome, and there are often long periods of thick weather during which no observations can be taken, and one must depend upon dead reckoning. Even when good observations can be had there is more or less uncertainty regarding the rates of the chronometers which cannot be checked during the sea voyage, save by comparison with each other. The wireless project is directed to the distribution of standard time signals so that the chronometers can be checked during the whole of a transatlantic voyage as readily as they would be by telegraphic signals or the dropping of a time ball while in port. The plan is to distribute time signals over the whole ocean by wireless from a central station located at some convenient point—the peak of Teneriffe, for example.

Carried out in this way, the chronometer error in the determination of longitude would be practically eliminated, thus considerably simplifying the situation. There still remains the difficulty of finding local time in thick weather. In clear weather, with the chronometer error out of the way, positions can be ascertained with very satisfactory precision. There is, however, another possibility of a somewhat startling character which may yet be realized. If it becomes possible to send out a wireless impulse, that shall travel clear around the globe, finding longitude, will be a very simple matter. For at the speed of electrical waves an impulse would girdle the globe equatorially in about a seventh of a second. A ship 180 degrees of longitude from the sending station would receive two impulses, one from each direction, simultaneously, and one-fourteenth of a second late. At any other place she would get the two impulses received on the same instrument at an interval which depends directly upon her position in longitude. It should be possible to measure this interval, say, by a revolving mirror method with sufficient precision to give a very good position in any weather. Assuming the wave path to be a great circle, a second sending station would enable a ship to get two angular co-ordinates from a known base which would fix her position both in longitude and latitude. Evidently the success of such a process depends on some factors as yet unknown. It is by no means certain that the wave path would necessarily be a great circle or that the speed of propagation would be exactly uniform. If, however, variations from the uniform law were systematic they could be soon ascertained and allowed for. Of course, the interval of time to be measured is very small, but it is nevertheless capable of surprisingly exact measurement, good enough certainly to give a great improvement over dead reckoning. Such possibilities are a strong argument for international control of wireless since the success of such a revolution in navigation as is here outlined would depend upon an international agreement for silence in the ether while the world-wide signals were being distributed.

NEW YORK, WESTERN UNION.

Captain Charles E. Kemp, aged forty-four years, of the police force, New York, died, on May 16. Prior to 1889, when he was appointed a policeman, he was a telegraph operator at this office, where he was well and favorably known, and where he always retained many friendships.

D. T. Sheridan, quadruplex chief, has the sympathy of the force because of the death of his father, which occurred on May 9.

OTHER NEW YORK NEWS.

Assessment No. 479 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of John J. Tidwell, at Shreveport, La.; Albert H. Baab, at Cattaraugus, N. Y.; Harl H. Lee, at Oklahoma City, Okla.; Charles H. Stancliff, at Stonington, Conn., and Charles G. Pond, at Boston, Mass.

Wireless Telegraphy for Schools.

Mr. L. Keys, of the Keys Commercial and Trades Institute, Little Rock, Ark., having met with much success in the transmission of wireless messages in the vicinity of Hot Springs, Pine Bluff and Little Rock, is now extending the field of operations and installing complete and thoroughly reliable outfits in colleges all over the United States, teaching telegraphy. By using wireless transmission students can be taught telegraphy at their homes, which means a great saving in time and expense. The apparatus is inexpensive, and the main sending station being located on the roof of a ten-story building in Little Rock, a large scope of territory can be reached. Where like conditions prevail Mr. Keys feels that many colleges will be able to do good work with wireless. Captain Henry, of the United States Navy Wireless Corps, assisted Mr. Keys very materially with his first experiments.

Mr. W. P. S. Hawk, superintendent of the Postal Telegraph-Cable Company, Salt Lake City, Utah, in renewing his subscrnption, states: "Telegraph Age certainly gets better all the time."

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Penny-a-Word World Telegrams.

Mr. J. Henniker Heaton, M.P., has an interesting article in the May number of the "Financial Review of Reviews," London, in which he advocates penny-a-word telegrams throughout the British Empire, and eventually throughout the world.

Mr. Henniker Heaton declares that the whole world is suffering from the exactions of a cable monopoly which charges for its service at a rate which is not justified by the cost of working, and he gives figures to show that the only problem to be solved is that of placing on each wire the maximum load. If that were done, he declares, penny telegrams would pay for working.

As a preliminary he proposes that the Home and Colonial governments, acting together, should acquire not only all the land telegraph lines but all the inter-imperial cables lines at a fair valuation and work them for the benefit of the whole people.

"For a quarter of a century I have been in active correspondence with the Postmasters-General of England," he says, "but, able men as they all were, I can unhesitatingly assert that we have never yet had an Imperial official of the kind—by which I mean one with Imperial instincts. During this long period there has only been one conference of the Postmasters-General of the Empire in London.

"I am confident of seeing a penny telegram service in full operation for the entire Empire, the cumbrous and tedious operations of the post office being reserved for the transmission of valuable documents, newspapers, circulars and parcels.

"There is an increasing demand for cheaper telegrams to our Colonial Empire. The immense distances to be covered explains this. It takes from two to twelve or thirteen weeks to exchange letters with a Colonial correspondent, and in order to avoid such a loss of time tens of thousands of people would be willing a spend a moderate sum in telegraphing social and family matters.

"Here we have two nations, Britain with some forty millions, and America with eighty-five millions. Parents and friends are left in the old country, and the young sons who go to the States or Canada often settle down and marry, and so form and strengthen the bond of union between the Old and the New Worlds. Yet of the great total of one hundred million people not one family in one hundred cables one word in a year."

Obituary.

Miss Caroline Tibbitts, aged twenty-three years, a telegraph operator employed at Danby, Cal., committed suicide, May 10, while temporarily insane. Miss Tibbitts, whose home was at Toledo, O., had gone to California for her health.

Luther Ruthrauff, aged sixty-five years, for many years connected with the Commercial News Department of the Western Union Telegraph Company, New York, died at the Soldiers' Home, Bath, N. Y., on May 20. He was at one time located at Macon, Ga.

The Serial Building Loan and Savings Institution, 195 Broadway, New York, organized by telegraphers for telegraphers, has withstood the shock of financial depression and stands to-day strong and impregnable, providing an absolutely safe place of deposit for telegraphers' money, whose accounts it solicits. It can also aid in the acquiring of a home. Why not become posted regarding its methods?

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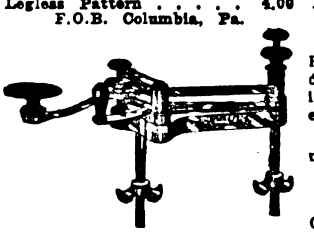

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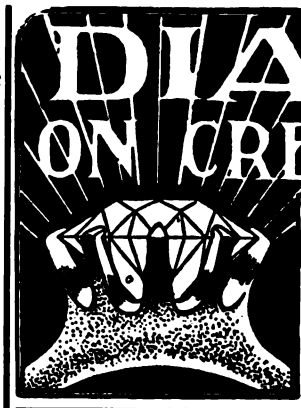

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Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26 and 27, 1908.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich. Time to be chosen later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers' Association meets at Fort Worth, Tex., on June 18, 1908.

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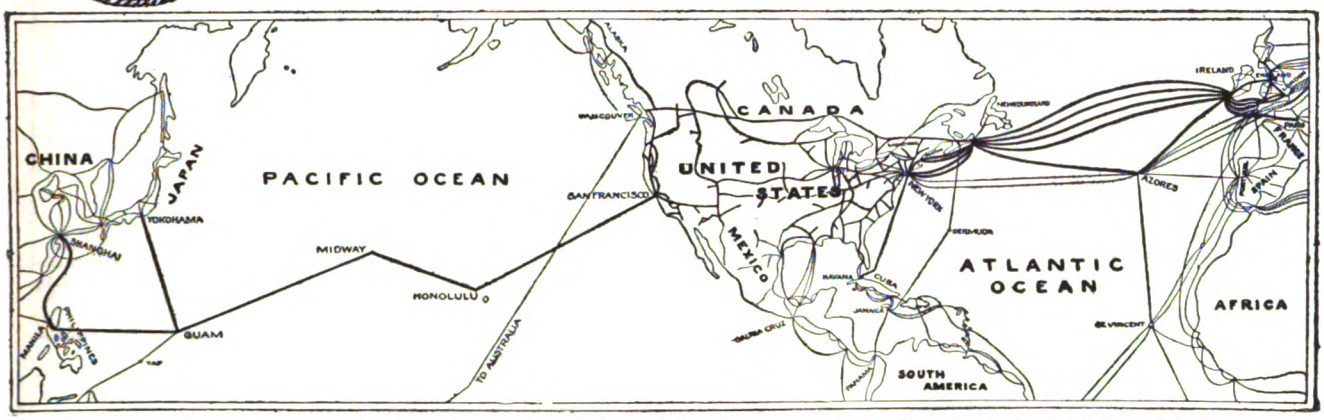

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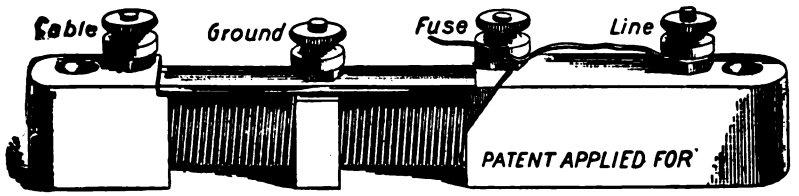

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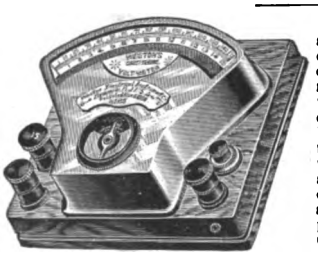

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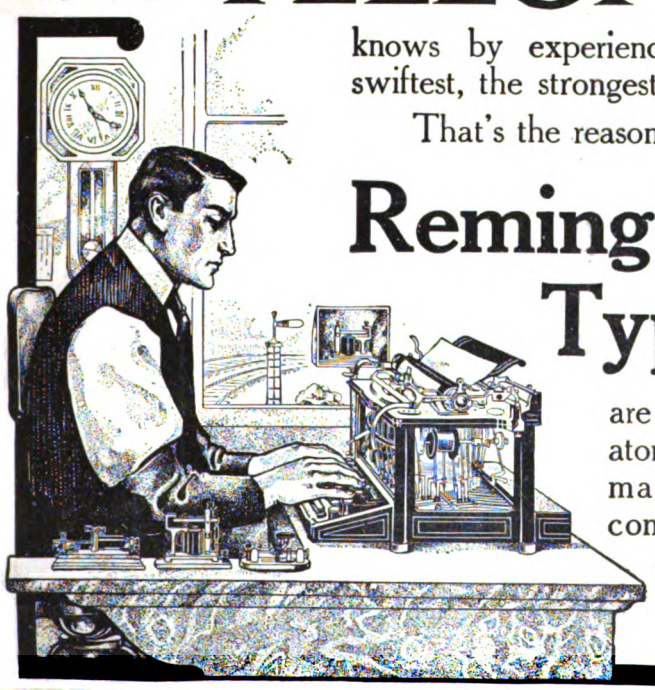

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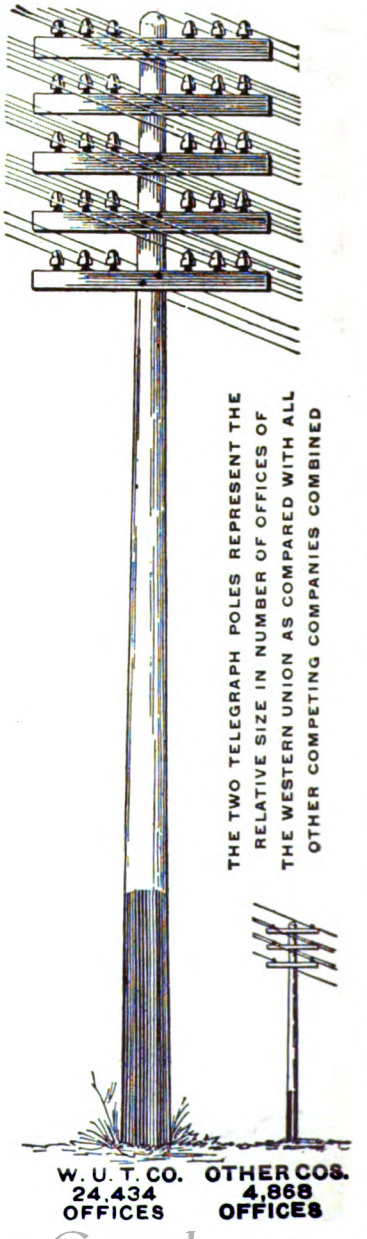

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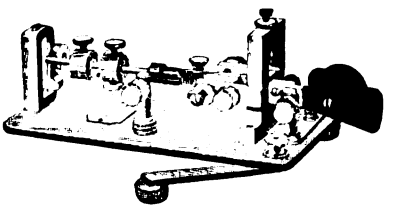

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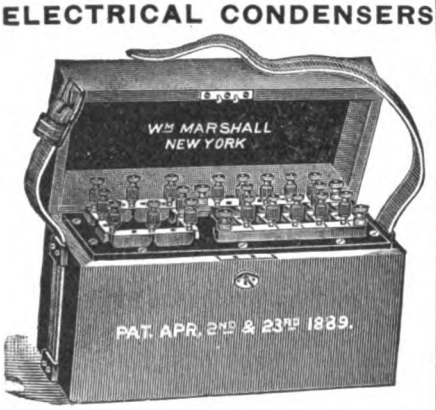

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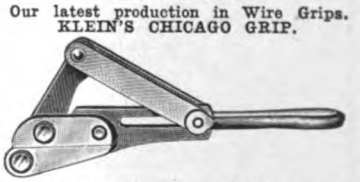

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(Concluded)

BY WILLIS H. JONES.

In the preceding installment of this article it was shown that the "balance" of a duplex circuit, as indicated by the unplugged resistance remaining in the rheostat, represents the resistance of the external circuit; that is to say, that of the conductor, distant multiplex and battery.

When it comes to the question of measuring the electromotive force of a distant multiplex battery with a voltmeter, or calculating its value by Ohm's law from the current and resistance indicated there are certain precautions and allowances to be made owing to the complexity of the circuit and unreliability of the value of resistance the rheostat indicates. It should be borne in mind that while new rheostat coils are wound practically as marked, there is no real necessity for accuracy, hence a balance may be approximately correct with one, and very much out of the way with another, so far as the figures show, while each, of course, will really contain the same amount of unplugged resistance.

Assuming, however, that the rheostat markings are correct, the different values of current, resistance, and electromotive force at various points in a duplex circuit balancing on, say, 3,000 ohms and equipped with a 200-volt battery, should be as indicated in the accompanying diagram, Fig. 1, provided the wire is free of "escape." Students should study the circuit carefully, as it presents the subject of current division and the drop of electromotive force in divided circuits in a varied and practical form.

In this diagram the line wire proper measures

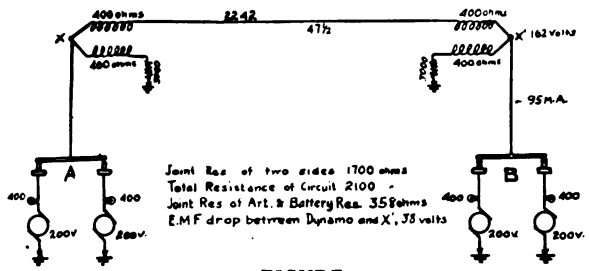

FIGURE 1.

2,242 ohms, and the joint resistance of each set to the incoming current is 358 ohms, while the line coil of the relay adds 400 more, making a total of 3,000 ohms, as the value of the external circuit as indicated by the rheostat.

Now, one would naturally suppose that if we ground the line wire at the main switchboard and measure the current flowing, that the product of its value in milliamperes and the resistance of the circuit 3,000 ohms, would give us the initial value of the multiplex battery creating it, in accordance with Ohm's law, R X = C. Such, however, is not the case where a duplex apparatus is in circuit. The voltage obtained, by this rule, under the conditions stated, would merely represent the diminished pressure of the distant battery at the split X^1, or, in other words, at the point where the battery simultaneously feeds two circuits, namely, the main and the artificial lines. Hence the true pressure of the distance battery must be equal to the pressure obtained by the formula mentioned plus the "drop" in voltage between the brushes of the distant machine and the split X^1. The rule holds equally good when computing the pressure by means of a voltmeter. We cannot read beyond the actual pressure that is feeding the line, except by removing the distant leak which causes the "drop," namely, the artificial line or rheostat.

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To demonstrate this point let us recur to the first diagram. Suppose we wish to measure the electromotive force of the 200-volt battery at station B. It will be found that the voltmeter computations will indicate but 162 volts, omitting fractions, and an ammeter 47½ milliamperes of arriving current. If we figure this out by Ohm's law we shall see that these readings are correct.

The total resistance of the circuit the distant battery feeds is, of course, that of the battery lamp, 400 amperes, plus the joint resistance of the main and the artificial lines, 3,400 ohms each, or 1,700 ohms, which makes 2,100 ohms in all. As the voltage drops in direct ratio to the resistance overcome it follows that after the 400-ohm battery resistance it overcome the drop will

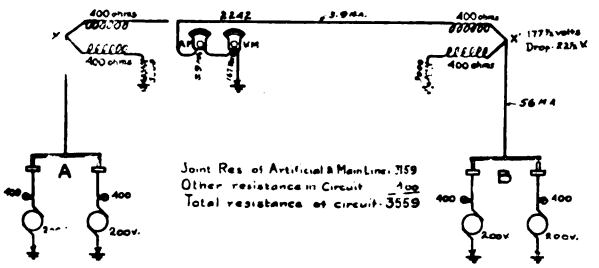

FIGURE 2.

$$\text{be } \frac{400}{2100} \text{ of } 200 \text{ volts} = 38 \text{ volts, hence there}$$

should be 162 volts at X¹ as indicated.

Again, if the circuit of 2,100 ohms is fed by 200 volts, $\frac{200\ E}{2100\ R} = 95$ milliamperes of current supplied, all of which flows as far as X¹ while half of it, or 47½ milliamperes flow through each side of the split.

The drop in the electromotive force of the battery at the point X¹ may also be shown in another way. The product of the current and the resistance in the conductor represents the value of the pressure necessary to create the volume flowing, hence if we multiply the .095 current by 400 battery resistance the product is 38 volts, leaving 162 volts to feed the two sides of the multiplex circuit and furnish the current to operate the relays. In passing it may be interesting to note the manner in which an arriving current is disposed of. In the circuit shown in the diagram, Fig. 1, the current passes through the line coil 47½ strong, but when it reaches the split X¹, about 5 milliamperes are diverted through the artificial line, leaving 42½ to find the ground via the lamp and battery. Now, a few words concerning the dial readings of a voltmeter when that instrument is connected with a conductor for the purpose of ascertaining the electromotive force of a distant battery or its value at any given point in a circuit. No doubt there are a great many users of this instrument who take it for granted that the reading of the dial invariably gives the correct information sought when seeking the value of electromotive force at any particular point. This impression is not quite correct. The qualification is this: A voltmeter while strictly a direct-reading instrument, gives a correct value of the original electromotive force existing at the point of connection, only when its connection therewith does not alter the original amount of resistance of such circuit to any appreciable extent.

For illustration—before a voltmeter is connected to the multiplex circuit shown in Fig. 1, the different values of current, resistance and electromotive force should be, normally, as marked.

Now, if we should go to the board and, after removing the home apparatus, insert a voltmeter of 42,000 ohms' resistance in the circuit in series therewith and expect the dial to show but a few volts' pressure to represent the almost totally spent energy at the point of connection; or figure out by such indication that 162 volts is still the pressure at X¹, we shall be disappointed. Owing to the new conditions now existing in the circuit, all the original values have been altered, as may be seen by a glance at the new markings at the same points in Fig. 2. Instead of the electromotive force at X¹ being 162 volts, as originally, it is now 177½, yet the voltmeter will indicate but 167 volts. The original drop of pressure between the machine and the split was 38 volts, now it is 22½. The current in the main line has dropped from 47½ to three and one-tenth milliamperes, while the resistance of the line circuit has been increased 42,000 ohms, minus a few hundred ohms in the home apparatus removed. Notwithstanding the apparently incorrect value indicated by the voltmeter dial, it can be shown that the reading is proper and really gives a direct reading of the actual pressure in the circuit as now altered at the point where it is connected. When we alter the resistance of a circuit it is necessary to figure out how much we have lost or gained by the change before we get a final result. According to the voltmeter reading we are short about 10½ volts in making up the 200 volts. Thus 167 + 22½ is but 189½ volts. What has become of the rest? The answer is, 10½ volts were required to furnish 3.9 milliamperes in the main line and 400 ohm relay coil between the split X¹ and the voltmeter, hence the latter droped 10½ volts.

In concluding this subject we will say that in handling a voltmeter the requirement is that it be used understandingly.

To measure the electromotive force in a closed single line circuit at a given point connect one terminal of the voltmeter to the conductor at the place designated and ground the other, thus making a high resistance leak of the voltmeter coil. If the resistance of the leg of the line conductor is very small compared with that of the voltmeter there will be practically no alteration in the original resistance of the circuit, hence the dial will give directly the information sought. If, however, the leg possesses so high a ratio of resistance to that of the voltmeter that the joint resistance of the two materially alters the conditions the reading

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will then indicate something less than the actual pressure existing at that point before the voltmeter was connected. All such losses in electromotive force must be figured out and the result added to the dial reading in order to get the correct value.

Postal Telegraphic Apparatus.

[Under this head there will appear in each issue of Telegraph Age an illustration and descriptive account of some feature of the equipment of the Postal Telegraph-Cable Company, prepared by John F. Skirrow, associate electrical engineer of the company.]

The switchboard block herewith illustrated is a complete switchboard, fuse and arrester outfit for one wire. The block is made of porcelain and is equipped with cartridge fuses, carbon plate arresters and pin jacks. In mounting these blocks it is necessary only to screw them to the wall, no frame being required. A number of these blocks may be grouped together to form a switchboard for several wires, cross connections being made by patching cords, having a solid plug on each end.

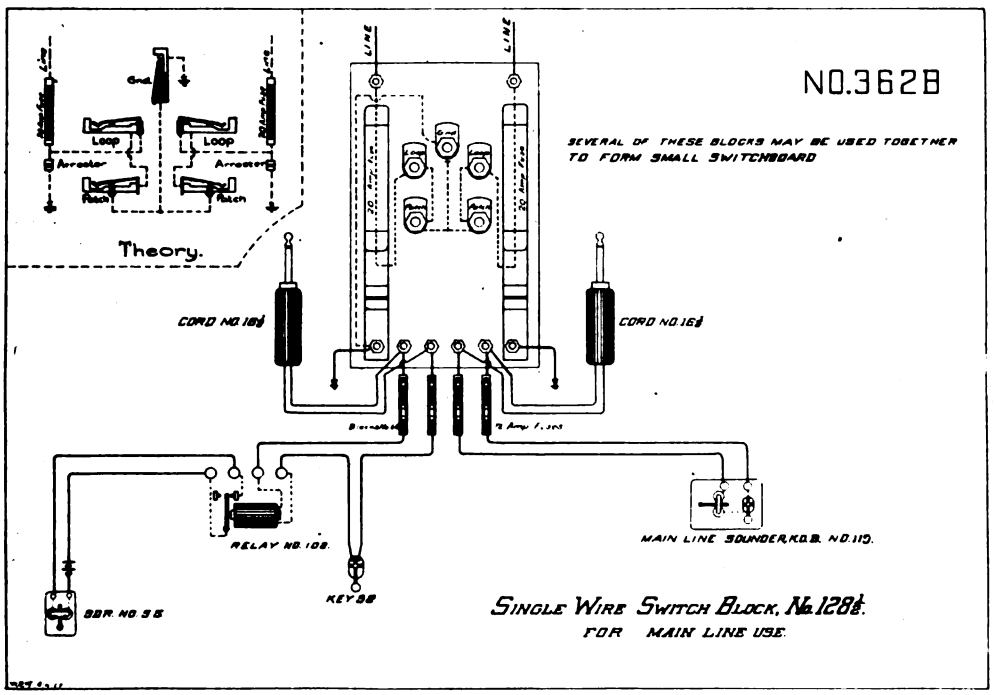
To ground a wire in either direction a solid plug is placed in the ground jack. To open a wire, a similar plug is placed in the "patching" jack east or west as desired. To cross connect wires one plug of a patching cord is inserted in the patching jack of one wire and the other plug in the patching jack of the other wire east or west as desired. To test a patch by grounding at the line, one plug of a patching cord is held against the ground post below the arrester and the other placed in contact with the line where it enters the fuse. Instruments are cut in at the looping jack, being connected up as shown.

These blocks form very convenient and safe switchboards. They can be manipulated by those entirely unfamiliar with electrical connections. They are fireproof and practically indestructible.

Recent Telegraph Patents.

A patent, No. 888,098, for an automatic phototelegraph, has been granted to Arthur Korn, of Munich, Germany. Selenium cell apparatus having detail features.

A patent, No. 888,154, for an insulator, has been issued to Howard Friend, of Lexington, Okla. Has a specially formed split casting which embraces a two-part cylindrical insulator, so that the single fastening bolt used clamps all the parts tightly in place.



A patent, No. 888,905, for a printing telegraph, has been awarded to Charles L. Krum, of Chicago, Ill. A printing telegraph apparatus in which the messages transmitted are reproduced at the receiving station by being printed upon sheets of paper as in ordinary typewriter work. Complete construction of a magnet-operated type-bar machine, including all the electrical features and circuits for a special code having impulses of different strengths, and different polarities.

The following patent has expired:

Patent No. 452,913, for a septuplex telegraph, held by T. A. Edison, of Menlo Park, N. J.

Personal.

Mr. George M. Myers, of Kansas City, Mo., a well-known old-time telegrapher and capitalist, has been appointed a member of the newly organized Utilities Commission of that city.

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Mr. Henry W. Smith, an electrical engineer of Portland, Ore., a former telegrapher, is in New York, the city of his birth, returning hither for a visit. Mr. Smith is accompanied by his wife.

Mr. G. E. Gleason, vice-president and assistant general manager of the Dean Rapid Telegraph Company, of Kansas City, Mo., is in New York on business connected with his company.

Mr. Chester H. Pond, of Moorhead, Miss., an old-time telegrapher, and a member of the United States Military Telegraph Corps during the Civil War, now, and for many years past, prominent in southern business circles, was a recent New York visitor.

Mr. W. L. Truesdell, manager of the Columbus Dental Manufacturing Company, at Columbus, O., formerly manager of the Postal Telegraph-Cable Company, at St. Louis, Mo., was recently in New York and took occasion to call on his many telegraph friends.

Mr. Andrew S. Weir, president of the Electrical Aid Society of Philadelphia, one of the best organizations of the kind in the country, is now associated with the telegraph department of the banking firm of T. E. Allison and Company, that city.

Mr. George H. Kuhn, an old-time telegrapher, now the supreme court stenographer at Lansing, Mich., acting in conjunction with others, has produced an improved system of shorthand, which embodies, it is said, numerous improvements upon the methods now in vogue.

Mr. G. E. Cromwell, an old-time and military telegrapher, for twenty-five years previous to 1893 a prominent figure in telegraph circles in New York, and now living in retirement at Damascus, Pa., was recently in the city and looked up many of his old friends, some of whom he had not seen in years.

Mr. Frank H. Knights, one of the best known telegraphers of Johannesburg, South Africa, and who has visited the United States on two occasions, was married about three months ago at the Transvaal capital and has since that time moved to New Zealand, where he will engage in the telegraph service in that country.

Mr. G. F. Mansbridge, one of the chief officials connected with the government telegraph factory in London, is in this country for the purpose of introducing his patented condenser. From New York he will go to Chicago, and Philadelphia, besides visiting one or two other cities, returning to England at the expiration of two or three weeks.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Col. R. C. Clowry, president and general manager, accompanied by his secretary, Frank J. Scherrer, together with Vice-President G. W. E. Atkins, were in Chicago and St. Louis during the first few days in June on business connected with the company.

Mr. George J. Gould, vice-president of the company, sailed for Europe June 9 for a brief visit abroad, where he will join his family.

Mr. Jacob Levin, of Atlanta, Ga., general superintendent of the southern division, accompanied by Superintendent L. J. Maxwell, of Richmond, Va., recently made an extended trip of inspection through the first southern district. W. P. Cline, superintendent of telegraph of the Atlantic Coast Line Railroad, accompanied Mr. Levin and Mr. Maxwell over the line of his system.

Chevalier Joseph P. Spanier, the Italian general agent of the company, residing at Naples, will be married, July 9, to Mrs. May Heather Jerome, an American lady, at Claridges, London. Mr. Spanier has a wide acquaintance in this country to which he is a frequent visitor.

The following changes have occurred in the service of this company:

Mr. Charles F. Annett, manager of the New Haven, Conn., office for the past three years, has been transferred to the managership of the office at Goldfield, Nev., vice B. S. Jones, who will take a long leave of absence and visit numerous points on the Pacific Coast. Mr. Annett possesses a wide acquaintance in the West, dating back many years, to the time when he was located in Cheyenne, Salt Lake City, and more latterly in Chicago, where he filled the position of assistant superintendent of telegraph of the Illinois Central Railroad.

Mr. J. F. Rawie, who recently resigned the managership of the Toledo, O., office to go to California, has re-entered the service at Tonopah, Nev., where he is acting manager in place of J. L. Morris, absent on a three-months' leave of absence, spending the time in Oregon and Washington.

Mrs. Cree Horner has been appointed manager at Greensburg, Pa., vice Mrs. L. H. Law, resigned.

Miss Jane C. Joyce has been appointed manager at Oakmont, Pa., vice Miss Gertrude Lessig, resigned.

Mrs. H. B. Sells has been appointed manager at Warren, Pa., vice G. S. Walters, resigned.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

President Clarence H. Mackay, accompanied by Mrs. Mackay, visited Reno, Nev., last week, whither he went to attend the presentation ceremonies incident to his gift to the University of Nevada of a building costing $120,000, designed for the Mackay School of Mines. Mr. Mackay also unveiled a statue of his father, likewise a gift by him to the University. Returning East he stopped at Chicago in order to attend the Republican National Convention.

Mr. Charles C. Adams, second vice-president,

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will attend the Republican National Convention at Chicago in the company's interests.

Mr. H. A. Tuttle, general manager of the North American Telegraph Company, Minneapolis, Minn., was a recent executive office visitor.

Mr. H. C. Shaw, division electrical engineer, San Francisco, Cal., is in New York on business connected with the service.

Mr. W. H. McCollum, of New York, superintendent of construction, who has been ill with typhoid fever for several weeks at Los Angeles, Cal., has resumed the inspection of lines on the Pacific Coast, a duty in which he was engaged when interrupted by sickness.

The recent retirement, induced by continued ill health, of E. G. Cochrane from the office of general superintendent, announced in the June 1 issue of Telegraph Age, takes from the telegraph service one who represented the best type of the loyal telegrapher. He served the interests to which he was pledged with conspicuous fidelity and ability, while his capacity for work was prodigeous. For more than twenty years Mr. Cochrane was identified with this company, and it is safe to say that no man in the service had a finer record for qualities that constitute the gentleman, and the successful head of an important department. His friendships marked his sincerity. That he was beloved equally by his official superiors and by his subordinates, many of whom have been frankly outspoken in their words of esteem for the man and regret at his retirement, carries with it an expressive testimonial of worth and sterling character that is above all price. As a man and an official in the telegraph service, Mr. Cochrane established a standard.

The following changes have occurred in the service of this company:

Mr. Charles Stewart, manager at Clinton, Ia., has been appointed manager at Springfield, Ill.

Mr. B. F. Rommell, chief operator at Kansas City, Mo., has been appointed manager of that office, vice Harry Morlan, resigned to engage in other business at Dallas, Tex. (See Kansas City Notes.)

Mr. A. B. Matthews has been appointed manager at Topeka, Kan., vice Z. A. Emerson, resigned, to engage in other business at Auburn, Kan.

The Cable.

Three Commercial cables recently broken off the west coast of Ireland by British fishing trawlers, have been repaired and are now in working order.

A patent, No. 888,511, for duplexing telegraph lines, has been granted to Isidor Kitsee, of Philadelphia. Is designed to dispense with the usual artificial cable at each station.

A patent, No. 888,096, for cable telegraphy, has been issued to Isidor Kitsee, of Philadelphia. Has a line with a condenser included therein and a shunt circuit including a polarized receiving instrument, a resistance and a serially connected condenser.

At the annual meeting of the Mexican and of the Central and South American telegraph companies, held in New York, June 3, the old boards of directors were re-elected. W. Emlen Roosevelt was made vice-president of the latter to succeed Charles Lanier, resigned, but who remains as a director.

Cable communication is interrupted, June 11, with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Island of Lanzarote (Canary Islands)	May 18, 1908
Steamer from Las Palmas.	
Demerara	May 30, 1908

Patents No. 888,509 and 888,510, the latter relating to modifications of the former, for a cable telegraphic system, has been awarded to Isidor Kitsee, of Philadelphia. Makes use of an extremely sensitive relay in a cable system, which shall control a circuit or circuits associated with or including a second relay of less sensitiveness, the second relay serving to produce or record messages at its station as received by the extremely sensitive relay, and to repeat such messages received by the extremely sensitive relay into another line or cable.

In the English Parliament Mr. Bellairs lately asked the Under Secretary for the Colonies whether the estimated loss to the British taxpayers (£62,590) on the Pacific cable for 1908-9, was mainly due to the faulty route selected, to the barren rock called Fanning Island, and whether it was practicable, and if so, would the question be considered in conjunction with the Colonial governments, to under-run and relay the cable to Honolulu, so as to benefit British shipping, afford alternative routes by the American cables, and give a fresh route to the Far East? Colonel Seely said the estimated loss on the cable for 1908-9 was £69,000, of which only five-eighteenths would fall on British taxpayers. The route via Fanning Island was adopted in accordance with the desire of the Colonial governments that the cable should touch only British territory. In the absence of suggestions from those governments H. M. Government did not propose to consider the question of relaying the line so as to touch at Honolulu.

Commodore E. Suenson, the managing director of the Great Northern Telegraph Company, Ltd., of Denmark, in a recent report respecting his company, said that during the last two years the number of cables in Europe had been increased by four, the Shetland-Faroe-Iceland cable and the Denmark-Libau-St. Petersburg cable, each composed of two distinct sections. The working of

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the Vladivostock and Kiachta routes, he said, had continued to improve. The new cable between Russia and Denmark had to be laid under great difficulties on account of the intricate nature of the Baltic Sea, and the laying consequently required a great deal of skill. The work was, however, successfully carried out in July, 1907, by the cable steamer Von Stephan, belonging to "Norddeutsche Seekabelwerke" of Nordenham (Germany) which company had also manufactured the cable. The length of the eastern section of the cable (St. Petersburg-Libau) was 472 nautical miles, and of the western section (Libau-Stevns) 319 nautical miles, making a total of 791 nautical miles. In the ordinary circumstances the cable was worked direct between the company's St. Petersburg station and the Danish telegraph office at Fredericia, from which place six of the company's other cables landing in Denmark were worked. The telegrams between St. Petersburg on the one side, and England and France on the other side, could thus be sent by the new cable with only one re-transmission, to the great advantage of the service, as regards both accuracy and speed. The value of the cable for the meteorological service had been satisfactorily proved. They had acquired a large new building for the company's offices and station at Shanghai, the most important telegraphic center of China. Parts of this building had been let to the Eastern Extension Telegraph Company and the Commercial Pacific Cable Company, by which arrangement the exchange of telegrams between the three companies would be accelerated. The new offices, which were inaugurated on January 5, this year, contain all the most modern facilities and technical installations. In regard to the difficulties which arose in the Far East as a consequence of the great political changes in that part of the world after the last war, and of the approaching expiration of the company's exclusive privileges in Japan, complicated negotiations had been proceeding. In Japan the negotiations were continued up to February this year, when they were suspended in order to be resumed in Europe, during or after the International Telegraph Conference.

Radio-Telegraphy.

The Spanish government will establish twenty-four wireless telegraph stations. Fifteen of these stations will be on the Spanish coast, seven on the Canary Islands and two on the Balearic Islands. The stations are to be sufficiently powerful to ensure efficient intercommunication between the places mentioned. By the erection of these stations, it is said that Spain will become independent of the present English and German cable systems, and thus the payment of large subsidies will be avoided.

Major Edgar Russel, assistant to the chief signal officer of the army, who was one of the passengers in the Signal Corps balloon which made a flight, on May 13, from Washington to Patuxent, Md., said that the wireless experiments conducted during the flight were highly successful and will be continued. "I think that I can safely predict," he said, "that wireless telegraphy to and from a balloon can be used in war. This means that I am sure that we will shortly perfect an apparatus that can be safely and successfully used in both receiving and sending messages from a balloon to any station within a radius of many miles. Yesterday we carried only a receiving apparatus, and this worked perfectly. We did not try to send for fear of the danger that lies in sparks from the sending instrument. When up over Washington we could receive from the Annapolis station clearly. The apparatus we used was just the reverse of the ordinary type of wireless station. Instead of erecting the antennae on a tall mast we hung them down from the basket, consequently the entire instrument was in reverse of the usual form. We covered the basket with a wire netting, which took the place of the usual counterpoise cables extending from the bottom of the mast in the ordinary mechanism. A wireless telegraph system from balloons will undoubtedly prove most useful in warfare, making the balloon fully 300 per cent. more effective in its destined work of making reconnoissances. With an apparatus similar to the one we carried and with the addition of a sending apparatus a balloon could go up from the headquarters tent on a battleground and, floating over the enemy's position, give the commanding officer exact details of every move made and every position, transmitting this information direct through the headquarters wireless station."

The Western Union Quarterly Dividend.

The Western Union Telegraph Company declared, on June 10, a quarterly cash dividend of one-half of one per cent. This compares with the old rate of one and one-quarter per cent quarterly, which was suspended last January, when a stock dividend was declared. The April dividend also was in stock. Earnings of the company for the quarter ending June 30, estimated in part, show a net revenue of $1,400,000, as compared with $1,537,201 in the same quarter last year, and a balance after interest of $966,938, against $1,148,701 in 1907. Deducting the dividend just declared, $497,556, against $1,217,025 last year, leaves a surplus of $469,388, compared with a deficit in the corresponding time in 1907 of $68,388.

The earnings of the current quarter were larger than in the March quarter, when the net revenue amounted to $1,330,886, with a deficit of $332,276, after the stock dividend of $1,230,100. For the fiscal year the approximate earnings show a net revenue of $3,223,335, as compared with $6,324,210 in the preceding year, and a deficit after dividends of $2,671,188, against a deficit of $36,053 in 1907.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

PRELIMINARY REMARKS.

In the transmission and reception of the signaling impulses over a main line wire, the Barclay Printing Telegraph system makes use of the telegraph apparatus regularly employed in the operation of fast speed automatic duplex circuits.

This apparatus consists essentially of an automatic transmitter which, under the control of a perforated tape, sends out currents of the required polarities and duration at a high rate of speed; a sensitive polarized relay that responds to the signaling currents, and, simultaneously repeats them into a set of local relays and other apparatus more directly concerned in the operations necessary for printing telegraph purposes.

With the exception, therefore, of the main line relay, the various appliances in use at the receiving end of the line form part of one or other of a number of local circuits, in each of which the current is fixed at the value necessary to meet the working requirements.

Messages for transmission are first prepared on a strip of paper by means of an automatic perforator provided with the universal keyboard. The arrangement of the perforator is such that upon depressing any one of the keys a series of small punches are urged forward and cut clean round holes in the paper strip. The various combinations produced, together with the proper spacing and feeding of the strip, are brought about by selective arrangements that constitute the distinguishing feature of the perforating system, and to which further reference will be made.

It may be here remarked, that under the present signaling arrangement which involves the transmission of six pulses for each letter or character to be printed, only thirty-two combinations or permutations on the punched tape are possible. With that particular number of combinations, fifty-six characters on the typewheel, in addition to the space, paper or line feed, typeshift, and carriage return movements are brought into play. (See Fig. 1.)

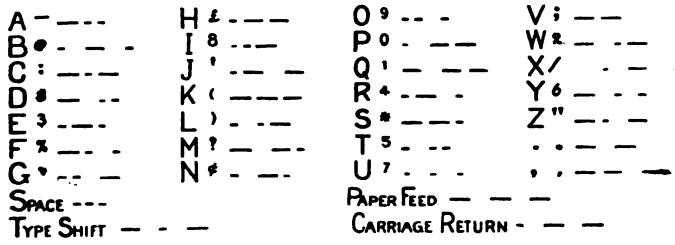
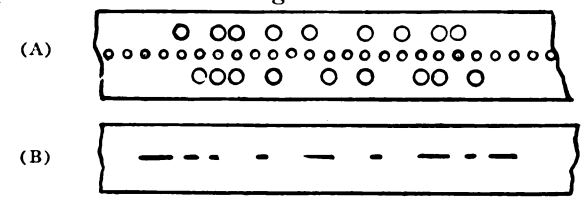


FIGURE 1.

The composition of each combination is such that when the punched tape is run through the transmitter there is transmitted to line for each letter or character, a series of six electric currents or impulses, three of which are negative or marking pulses, and the other three positive or spacing pulses.

In Figure 2 (a), is shown a specimen of the perforated slip representing the letters a, b, c; and in (b) the signals corresponding thereto, as received upon a suitable recording instrument.



(A) Punched tape. FIGURE 2. (B) Received tape.

It will be observed that there are three parallel rows of holes on the punched tape. By means of the upper and lower openings, the movements of a polechanging device in the transmitter can be so determined and controlled as to insure the correct transmission to line of the various signaling currents, which are constantly changing both in direction and time duration.

The center and smaller row of holes is for the purpose of admitting the teeth of a small star wheel with which both the perforating and transmitting machines are provided, and by means of which the feeding of the paper slip through those instruments is suitably accomplished.

This slip is 15/32 inch wide and between four and five thousandths of an inch thick. The correct regulation of and distance between the perforations should be as follows: For dots, which are formed, as shown in Fig. 3, the vertical dis-

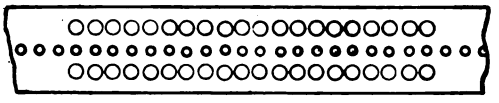


FIGURE 3.—DOTS.

tance from center to center of the upper and lower holes should be one-quarter inch, and from the center of one opening to the center of the next opening taken lengthwise, the horizontal distance should be one-tenth inch.

The center row of holes should occupy a position equally distant between the upper and lower series of perforations.

For dashes, which are formed, as shown in Fig. 4, the top holes should be one-tenth inch in ad-

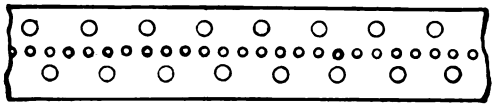


FIGURE 4.—DASHES.

vance of the lower ones, measured from center to center.

The duration of battery contact, and the direction (or polarity) of the signaling impulses are determined by the relative positions of the various perforations.

In the make up of the different characters representing the printing code, marking and spacing impulses of both long and short duration are used

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in predetermined combinations to form the printed letters or characters desired.

The length of a marking impulse required to form a dash is three times that necessary in the formation of a dot, and similarly, a long spacing impulse is three times the length of a short spacing impulse.

Between the component parts of certain letters (such, for example, as c, e, h, etc., Fig. 1), short spacing impulses flow to line; in others (such as b, u, x, etc.), the longer spacing impulses are transmitted; while between the elements of some letters (as d, f, g, etc.) both long and short spaces comprise part of the character impulses.

The regular "space" or distance between the various words, groups, etc., on the printed message, is secured by the punching of three dots (Fig. 5) at the end of each word, figure group, etc., on

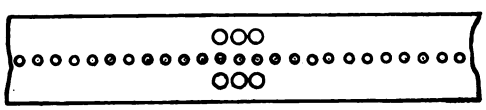

FIGURE 5—"THE SPACE."

the prepared tape. On a Wheatstone receiver the corresponding signals would be registered thus: ····· but as these signals are produced by means of short pulses alternately negative and positive, no combination is set up in the selective apparatus. The long spacing pulse, however, which follows this series of dots, finds a path open to it through the spacing magnet, the energizing of which operates the spacing attachment of the printer, and in this way leaves a blank space upon the paper.

(To be continued.)

The Railroad.

Mr. A. E. Roome, superintendent of telegraph of the Southern Pacific Company, at San Francisco, Cal., has resigned.

Mr. W. F. Williams, superintendent of telegraph of the Seaboard Air Line Railway, Portsmouth, Va., was a recent New York visitor, as was also Mr. W. W. Ryder, superintendent of telegraph of the Chicago, Burlington and Quincy Railroad, Chicago.

The Delaware, Lackawanna and Western Railroad Company will soon begin to operate its trains by telephone over the Scranton-Binghamton division. Probably in the course of a year the train despatching over the entire system of this road will be conducted by telephone in supersedure of the telegraph.

Mr. George L. Lang, formerly superintendent of telegraph of the Queen and Cresent system, with headquarters at Chattanooga, Tenn., but who has been in retirement for the past two years, was a recent New York visitor, where he took occasion to call on numerous friends. After a brief visit to Boston, Mr. Lang returned South and in future will make his home in Chattanooga.

Mr. S. K. Bullard, of Sedalia, Mo., superintendent of telegraph of the Missouri, Kansas and Texas Railway system, is taking a rest of a year at Redlands, Cal., whither he went in December last. This is a well-earned vacation for Mr. Bullard and was entered upon after a service of thirty years in the railway system to which he owes allegiance. During his absence Mr. William H. Hall, the assistant superintendent of telegraph, is performing the duties of the office.

The typewriter has usurped the place of the pen to such an extent in many departments of business that penmanship, at least so far as legibility is concerned, is almost a lost art. For the purpose of putting a record that this does not conclusively apply to the railroad service, the Railroad Gazette publishes a reduced fac-simile of a written train order conspicuous for its perfect legibility, although free from all attempt of fine writing, remarking that "at places where a machine is not available, it is refreshing to find an operator who can produce readable copy." The order in question is written on a form of the Nashville, Chattanooga and St. Louis Railway, the paper quoted stating that the train orders on that road "are carefully and constantly inspected by a sharp-eyed man from headquarters, and not only is slovenly penmanship rigidly subdued, but any tendency on the part of despatchers to use ambiguous wording also is nipped in the bud."

J. B. Sheldon, Union Pacific Superintendent of Telegraph.

John Burwick Sheldon, lately appointed superintendent of telegraph of the Union Pacific Railroad, with headquarters at Omaha, Neb., elevates to that position on a great line of railroad, a telegrapher well fitted by long experience for so important a post. Like many another who has climbed the ladder of promotion, Mr. Sheldon has risen from the bottom. The fitness of the man for the place to which he has been advanced may be estimated from the fact that he succeeds L. H. Korty, lately retired on account of ill health, after a successful tenure of office of many years. Mr. Sheldon was born at Ottawa, Canada, August 15, 1860. In the spring of 1873 he became a messenger in the employ of the Montreal Telegraph Company in his native place. Learning telegraphy he held positions as an operator in various cities in Canada and the United States, finally accepting the place of night operator in the general telegraph office of the Union Pacific Railroad at Omaha, on January 1, 1882. In September, 1884, he was promoted to be manager, a position he continued to hold, together with exercising a supervision of all telegraph and telephone circuits and multiplex apparatus until appointed to be superintendent of telegraph on May 6. An engraving of Mr. Sheldon appears among those of other superintendents of telegraph, published elsewhere in this issue in connection with the story of the convention of the association to be held at Montreal.

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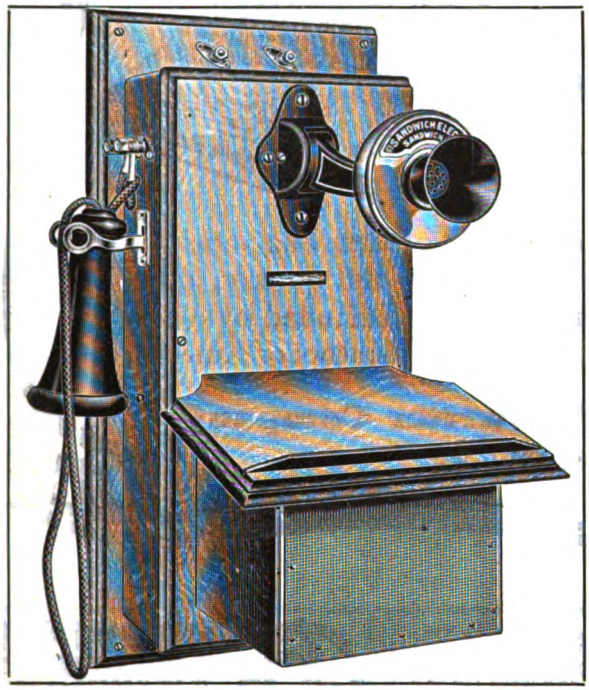
Railway Composite Apparatus



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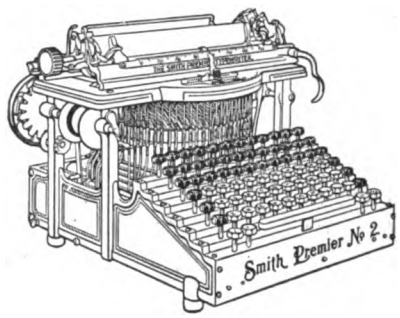

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JUNE 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Telephone and Telegraph Investigation.

A resolution was adopted by the United States Senate on May 28, introduced by Senator La Follette, directing the secretary of the Department of Commerce and Labor to "institute an investigation into all the telegraph and telephone companies engaged in the conduct of an interstate business as to the methods used in handling the public's business, the wages paid telegraphers, telephone operators and other employes of such corporations," and also to get a statement of the receipts and expenditures of the companies.

As a matter of fact the information called for by this resolution has already been carefully compiled and was published and distributed by the Department of Commerce and Labor, in 1907. Secretary Straus is quite right in remarking, as he is reported to have done, that the information called for by the resolution may be obtained without great difficulty.

Telephone Train Orders at the Convention.

The railway superintendents of telegraph will discuss many important subjects at their coming convention at Montreal, but none of the questions that will be brought up for consideration at that meeting are likely to elicit more interest, or arouse a more earnest discussion, than the transcendent one at this time of the telephone viewed in its important relations to train despatching. The substitution in large measure of the telephone for the telegraph in this particular, while perhaps to be expected consequent upon gradual and natural change, has nevertheless been hastened in its advent and forced upon the attention of and acceptance by railroad management by adverse legislation. The result has been, however, to place pressure upon intelligent thought and stir it to greater activity; to give a larger consideration to expediency and to stimulate invention. The sudden awakening to the adaptability of the telephone for all purposes of train despatching, and the very general acceptance of the idea, has come with a rush. It cannot be doubted that it has come to stay, for it has proven its usefulness and value. The realization of this fact is significant, and no doubt its discussion at the convention will be profound, interesting and extended. A further discussion will also probably relate to the train mail service, now coming into familiar practice, as a carrier of messages which heretofore were transmitted by wire. The full story of the convention is told in other columns of this issue, embellished with abundant illustrations, showing the personnel of the railway telegraph superintendents.

An Unfortunate Wording in a Telegraph Bill.

Some men go off half-cocked. Their zeal frequently outruns mature judgment, and the old Latin proverb of *Festina Lente,* in its interpretation of "hasten slowly," apparently has no place in their ethics, their understanding or their vocabulary. Congressman Cary, of Wisconsin, the whilom telegraph operator, affords an apt illustration of this generic proposition in the wording of his bill relating to the sending of telegraph messages, a paper alike unfortunate in its inspiration and its preparation, now quietly reposing in a state of desuetude, so left by an adjourning Congress.

In a hearing before the House Committee on Interstate and Foreign Commerce, at which George H. Fearons, the general attorney of the Western Union Telegraph Company, and G. W. E. Atkins, a vice-president of the same, appeared in behalf of that corporation, a feature of the argument concerning the filing of the time on all telegraph messages sent, was invested with a broad sense of humor.

In the first place, Mr. Atkins gave some inter-

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esting statistics bearing on the telegraph, and leading up to the subject referred to, carefully explaining and clearly defining the attitude of his company. He said that the average telegraph message consisted of about thirty words—that is, including the date, address and signature, and body of the message. To transmit these filing times and transmission times would take an average of three and one-half words for each time notation. That would be seven words for each message. The Western Union Telegraph Company handled during the year ended June 30, 1907, 78,804,551 messages. If the company had been required to transmit seven additional words for each of those messages, in order to show the time they were filed and the time they were put on the wire, it would have handled 523,631,867 additional words at the regular count. Reducing those words to messages, the company had, he said, the equivalent of 17,454,395 more messages than were transmitted, and that would all be free of charge.

In reply to inquiries made by a member of the commission, Mr. Atkins in explanation of his statement said that he arrived at the seven-word basis in this way:

"Here is, for instance, 'Eight a. m.' That means two words; 'eight' is one, and 'a. m.' is another. 'Eight one five a. m.' is four words (8.15 a. m.). 'One nought a. m.' (10 a. m.) is three words. 'One nought five a. m.' (10.15 a. m.) is five words. There you have four combinations of time which foot up fourteen words. Dividing this number of words by the number of combinations, you have an average of three and one-half words for each combination of time. Now, that would double, because you transmit the time of filing and the time it goes on the wire. That makes seven additional words for those two timings on a telegram that is transmitted over the wire. In addition to that the bill requires that the time of receipt shall be indorsed on the messages delivered. That, of course, necessarily takes a little more time when the operator is receiving the message, although it is not transmitted over the wire."

At this point Congressman Cary, the author of the bill, interrupted the proceedings to question the accuracy of Mr. Atkins's statements by asking whether it was "stated in that bill that you must forward the filing time twice?"

Upon being informed that the filing time and the time of putting it on the wire were provided for in the bill, Mr. Cary quickly asserted with a show of irritation: "I do not think so. I think the bill says the filing time must follow up the message; that is all." To this Mr. Atkins made the dry rejoinder: "It is your bill. You ought to know what it provides for, but it is as I have stated."

At this juncture, by way of a clincher, Mr. Fearons, the general attorney of the Western Union Telegraph Company, read the following sections of the bill in question:

(c) The above-described notations of the month, day of the month, and hour and minute of the day when such message or telegram is received for the above-provided transmission shall be forwarded with said message or telegram and as a part of said message or telegram, and at the cost and expense of said firm, person, co-partnership, association, or corporation accepting such telegram for transmission.

(d) In addition to sending the time described in subsection (c) there shall be forwarded as part of said telegram the hour and minute of the day at which said message or telegram is placed on the wire for transmission by the operator sending or forwarding such message or telegram, and at the cost and expense of said firm, person, co-partnership, association, or corporation accepting such telegram for transmission.

In concluding, Mr. Fearons remarked laconically, "the gentleman ought to read his own bill."

Public Control in Saskatchewan, Canada.

Briefly stated, the policy of the Saskatchewan (Canada) government creates a department of railways, telegraphs and telephones, and gives to this department control over all telegraph and telephone systems which may hereafter be constructed or acquired by the department, remarks the Western Electrician. The policy makes the building of long-distance telephone lines a provincial undertaking, chargeable to the province as a whole. It makes the matter of municipal telephone construction a municipal undertaking, chargeable to the municipality and controlled by the municipality. It makes the construction of rural telephone systems rural undertakings, chargeable to those who desire to unite as communities to secure the benefit of the telephone, and managed and controlled by them, and assisted by the government by a free grant of the poles, which is said to represent sixty per cent. of the cost of the construction of lines in Saskatchewan. The money to provide the construction of the long-distance lines will be provided by the issue of provincial debentures; that of municipal systems by the issue of municipal debentures, and for rural systems by the organization of joint stock companies, assisted by the provincial government. The long-distance, municipal and rural systems are united into a provincial system by provision in the bill for compulsory connection of all the systems upon an equitable basis.

The Austrian telegraph department, according to an article published in a foreign contemporary, has lately used for its larger installations a new type of cable in which the insulated conductors were covered with a layer of tin-foil in order to diminish and dampen the mutual induction of the conductors in the cable. While for telephone cables this arrangement has been effective in producing a certain amount of damping, it has been denied that it would be effective for telegraph cables. The writer of the article referred to has made an extended investigation of this problem with the aid of an oscillograph.

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Mutilation of Telegraph Signals.

BY JOHN F. SKIRROW.

[A paper pointing out in terse, vigorous and almost paragraphic form the various causes for the sudden mutilation of telegraph signals, was prepared for official use a short time ago by J. F. Skirrow, the associate electrical engineer of the Postal Telegraph-Cable Company. While to a certain extent academic in character, it nevertheless furnishes an amount of information on common subjects pertaining to the telegraph so clearly phrased as to invest the matter with unwonted interest, showing the author to be of discriminating mind and skilled in expression.—Editor.]

Telegraph signals are transmitted by imposing an electrical current upon a wire for periods of long or short duration with variable intervals between these periods. Signals are also transmitted by reversing the direction of the current upon a wire or by varying its strength. In multiplex telegraphy two or more of these methods are used upon one wire simultaneously.

When electric currents are transmitted over wires strung on pole lines it is necessary to use an insulating material (such as glass) at each point of support, to prevent leakage of the current to earth or from wire to wire. Moist surfaces are much better conductors of electricity than dry surfaces, and it will thus be seen that a rainstorm, which drenches line wires, insulators and poles, allows leakage to the earth, and to other wires upon the pole line, at every point of support. Wet snow, sleet and fog have the same effect. The effect of such leakage is to materially reduce the amount of current which reaches the distant end of the line.

Under such conditions the received currents are weak or erratic, and the receiving instruments respond sluggishly, failing occasionally to respond at all. Such failure by a receiving instrument to respond frequently results in combining or distorting signals so as to entirely change their significance.

It is often necessary to operate telegraph circuits during the prevalence of conditions which render their operation imperfect. Wet foliage swinging against wires during rainstorms makes variable leakage. It is impossible to adjust receiving instruments to exactly meet the constant variations of the received currents, and false signals are therefore often recorded under such conditions.

Lightning seeking a path to earth finds in aerial wires a ready route. When lightning discharges into a telegraph circuit the effect is to either reverse or augment the current passing over the wire, or to bridge in an interval between currents. The result is mutilation of the signals. During severe lightning storms lines are frequently rendered entirely inoperative, and when partially operative the signals are subject to much mutilation. The effect of such storms upon the signals is often noticeable at receiving stations when the storm causing the effect is at the transmitting point or en route, possibly a hundred or a thousand miles away.

In addition to these atmospheric causes, marked effects upon the signals transmitted over telegraph circuits have been noted during the prevalence of sun spots. Many theories have been advanced for the cause of magnetic and electrical disturbances during the prevalence of sun spots, but little is known except as to the results. Many examples are known of magnetic storms attended by aurora borealis and coinciding with violent disturbances of solar spots. These magnetic storms seem to have an irregular period. There was one in the winter of 1881-1882, another in the summer and fall of 1892, one in the summer and fall of 1903, another in the spring of 1905. During the prevalence of these storms telegraph circuits are seriously affected. On November 1, 1903, many telegraph circuits in both this country and Europe were rendered inoperative for some hours. On March 6, 1905, all of the circuits out of the Postal Telegraph-Cable Company's Chicago office were entirely inoperative for thirty minutes at a time, at intervals during the afternoon. The effect of such storms is to charge telegraph wires with a surging current which mutilates all signals transmitted. Disturbances of this nature but of lesser magnitude are frequent.

Beside the foregoing atmospheric phenomenon another appears in northern latitudes in the shape of highly charged snow clouds, driven by the wind along or across telegraph lines. The highly electrified particles of snow that are brought in contact with the wires yield up their static electricity to them, resulting in current that flows along the wires to the earth. In northwestern states such electrical snowstorms have, upon several occasions, seriously crippled the telegraph service by rendering unworkable some or all of the wires that passed through the region where the storm prevailed. In New Mexico, Arizona and Southern California the wires are annually crippled during the spring by somewhat similar phenomena caused by dry sand. Particles of dry sand in those regions become in some manner highly electrified, and during the sand storms which prevail there, are driven across and along the wires, and yield up their electric charges to them in the same manner as does the snow in the northern latitudes.

There is a marked difference in the manner in which the currents from snow and sand storms, and those due to the action of aurora borealis affect the operation of the wires. In the former case the disturbance from the current manifests itself at the contact points of the transmitting apparatus in the form of a spark or discharge which mutilates the signals. In the latter case, the auroral currents traveling in the wires act very much in the same manner as currents from a battery, but are of variable pressure, causing a current to flow in the wire, sometimes steadily in one direction, and occasionally changing its direction of flow at short intervals. At times

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these currents have remained so steady that the batteries have been removed and the transmission of telegrams effected for several minutes at a time, by the auroral current alone.

When two neighboring wires are parallel, one of them, although not in contact with the other, is electrified by currents passing in the other wire. This electrification is known as induction. When telegraph pole lines are located upon the same roadway or near high-tension electric light or power circuits, signals are affected and often mutilated by induction from such circuits. On March 10, 1907, the Postal Telegraph-Cable Company's wires northwest of Toledo, Ohio, were disturbed to such an extent from this cause that it was impossible to do any business on them between the hours of 12.30 A. M. and 6.15 P. M. and on March 11 between 7.30 A. M. and 11.58 A. M. We have had similar disturbances recently on wires paralleling the New York, New Haven and Hartford Railroad.

During the prevalence of very high winds wires sometimes swing together. The result of two wires coming in contact is a transference of current from one to the other, mutilating the signals. Broken branches or limbs of trees become entangled among telegraph lines during lightning and wind storms and cause leakage between wires, with consequent mutilation of signals. By accident or design metal hay ties are frequently thrown up among telegraph wires. These hay ties swinging from side to side make momentary contacts between the various wires, allowing interference of current and causing mutilation of signals. On account of their intermittent nature faults of this kind are difficult to locate, and they cause much interference and mutilation until they can be traced and removed. Kite tails are a prolific source of trouble on telegraph circuits. The strings of these tails connecting with several wires provide a ready path for electric currents when they become soaked during rainstorms and mutilation of signals results.

One effect of the sudden changes in circuit conditions resulting from the various causes enumerated is arcing or sparking at the transmitter points of the sending station. Another effect is the changing of the strength, direction or duration of the current, reaching the receiving station. In either event multilation of the signals results. Pole lines of various telephone, telegraph and other companies are often located upon the same side of the roadway. Under such conditions linemen repairing or replacing broken wires, or stringing new wires frequently cause interference. Wires in process of being strung sag down upon or swing among other wires, making momentary contacts. Similar interferences occur at intersecting points when wires are being strung upon a pole line which crosses over another pole line. During building operations nearby pole lines are often interfered with by the transfer of lumber. Boards are transferred from the sidewalk to the upper part of a building by being passed up one at a time from story to story. It frequently happens that these boards strike the telegraph wires while being transferred, and mutilation of signals results. Derricks and cranes are used for construction work upon railroads and other rights of way. The booms of these cranes are often swung around so that they strike the telegraph wires. This causes momentary contacts between wires and false or mutilated signals.

In a line one thousand miles in length several of the conditions enumerated may obtain at the same time.

Commercial Telegraphers' Union Convention.

The Commercial Telegraphers' Union of America has just concluded its annual convention at Milwaukee, Wis., the first session being held on June 8. Delegates coming from numerous cities were in attendance. President W. W. Beattie delivered an address welcoming the members, in which he spoke words of encouragement, expressing confidence in the principles of the union and hopefulness respecting its future welfare. A number of reports were read. It was shown that the treasury was in a depleted condition, the strike of last year wiping out all accumulations, yet hope was expressed that a fund of $200,000 might be raised, an amount it was thought which could be secured by means of a per capita tax. There was a notable lukewarmness of feeling respecting the question of inaugurating another strike, the possibilities of which have been hinted at of late. Lack of funds and the difficulty of raising money exerted an influence among members to conservatism of thought and action.

An election of officers resulted in the choice of S. J. Konenkamp, Pittsburg, president; C. W. Saults, Winnipeg, Man., vice-president; Wesley Russell, Chicago, secretary and treasurer, with an executive board as follows: C. E. Hill, Toronto, Ont.; Percy Thomas, New York; James B. Finnan, St. Louis, and Dr. C. M. Worth, Denver, Colo. The next convention, to be held in 1910, will be at Atlanta, Ga.

The Turning Point of Andrew Carnegie's Career.

Readers of Telegraph Age and members of the telegraph and electrical fraternity generally are always interested in anything relating to Andrew Carnegie, who in his early life learned to telegraph and who has often referred in his writings and public addresses to his pioneer work in that line. As a telegrapher, then, Mr. Carnegie possesses an individuality especially appealing to members of the profession, and an article bearing the title of "The Turning Point of Andrew Carnegie's Career," contributed to the July number of the Century Magazine by David Homer Bates, and which dips into telegraph reminiscence of historical value, will afford matter of abundant interest to the telegrapher.

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The Military Telegrapher in the Civil War.

PART FIVE.

John Lonergan had an active career in the Civil War as a military telegraph operator. In this capacity he displayed much skill and resourcefulness and personal bravery in the performance of his duties, characteristics, it may be remarked, which were shared in common and to a notable extent by the brave men who served their country at the key in the field in the time of its peril. Not much more than a youth when the war broke out, for he was born in 1843, he nevertheless did a veteran's part in the work that fell to his lot, and did it so well as to elicit the warm approval of Gen. George H. Thomas. In writing in 1878 from his home in Marysville, Kan., where he still resides, to Colonel William R. Plum, the historian of the military telegraphers, he gives in the following straight-forward and modest way, graphic in its very simplicity, an account of the part he sustained during the war, recalling the events, however, wholly from memory, the great fund of data, including many interesting letters, which he had accumulated, having previously been destroyed by fire:

"Shortly after I entered the field service of the military telegraph in March, 1863, at the headquarters of General Rosecrans, I was sent with five other operators to the Department of the Ohio, where from April to July, 1863, I was engaged on outpost duty at Stanford and Crab Orchard, Ky. While at the latter place I had what I may call my first 'war experience.' The rebel forces raided the town one morning about daylight. Attired in my night clothes only I managed to escape capture by hiding under a chicken coop, in front of which a friendly negro woman rolled a big log of firewood which shielded and completely held me from view. The enemy were quickly repulsed and driven out and I soon found release. Yet the situation into which I was forced was very realistic during the time it lasted, even though it was not free from its humorous side. It is not unbecoming a veteran, presumably brave, to remark that the comic side of the affair is more potent at this safe date of review than when it occurred.

"During General John A. Morgan's raid in Kentucky that year, when I was at Stanford, George A. Ellsworth, the famous operator attached to that rebel leader's command, tapped our line at or near Lebanon, but as we were expecting some such maneuver on his part he gained no information by his action. By using our operator's name at Lebanon, George Purdon, however, he got a train to leave Lebanon Junction which he captured, and among his prisoners was the operator at Lebanon Junction, by name Atwater, I think.

"I returned to the Army of the Cumberland July 9, 1863, reporting for duty at headquarters at Winchester, Tenn., and a few days afterward accompanied General Sheridan to his headquarters at Bridgeport, Ala. While at General Rosecrans' headquarters the general insisted on my sending a despatch during a thunder storm and I was knocked senseless by lightning. The advance of the army on Chattanooga from Bridgeport took place September 5, 1863. I was paired off with Wallace Forbes, Captain Batchelder and Lieutenant Connolly of the signal corps and by wire and signals kept communications open with the advance and rear.

"After the battle of Chickamauga, I was assigned to General Crook, commanding the Second Cavalry Division. While with this officer I forwarded despatches to General Sherman who was advancing eastward along the Memphis and Charleston Railroad. We experienced considerable difficulty in keeping our wire up between Stevenson, Ala., and headquarters at Maysville, Ala., as the Fourth Alabama Cavalry kept constantly raiding the line, and General Crook had to string out Colonel Long's cavalry brigade to patrol and repair the wire.

"At Brownsboro, Ala., I was forced to leave my office by the repeated night attacks from the rebels on the west bank of the Flint River. General Crook had me move my office to his headquaarters at Maysville, a mile distant, as he could not give me sufficient protection at Brownsboro without drawing from a direction that he deemed of more importance.

"In 1864, during the Atlanta campaign I was used as a floater; that is, I was sent where most needed. October 10, 1864, I was assigned to General O. O. Howard, commanding the Department and Army of the Tennessee, as cipher operator, with whom I remained until May 25, 1865. During this time I was associated with C. G. Sholes. He left us at Savannah, Ga. During the march from Atlanta to Savannah, I tapped the rebel wire in the rear of General McLaws' headquarters near station 7. Major Whittle, assistant provost marshal general, Captains Taggart and Bedford, adjutant general, and L. A. Sampson of the signal corps were with me. I intercepted messages from General Hardee to General McLaws, giving the movements of General Bragg on our rear from Augusta, also of the cavalry, the number of rations forwarded to McLaws, etc., which gave us information that was greatly desired. General Howard directed me to make an official report of the same for the benefit of General Sherman.

"I got a severe scolding, however, from General Howard for sending a message signing his name to it to General Hardee, inviting the latter to remain at Savannah and dine with us Christmas. Captain Bedford who suggested the message did not get off so well, but fared worse. General Howard felt very sore about it, as he said that he had every respect for General Hardee socially. While in front of Savannah and during the battle of Kings Bridge road, I tapped the Gulf line at Miller's Station and in full view of the rebel line of battle. General Howard was with me in person. We barely escaped capture. The timely

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arrival of the 7th Illinois Mounted Infantry saved us and captured a company of the Augusta Arsenal Battalion. I found this wire working all right, but our troops destroyed the wire in the direction of Savannah and spoiled a good thing. During our stay in Savannah with the assistance of Lieutenant Kelly, of the Navy, I relaid a cable from Beulah to Rosedew Island, and in connection with Lieutenant Allen, of the Signal Corps, we kept open communication with General Hazen who was dismantling Fort McAlister on the west bank of the Ogeechee River. During the storming of Fort McAlister Generals Sherman and Howard were on top of the rice mill at Chevis Point using the Signal Corps with General Hazen who was making the attack on the fort. General Sherman made the remark that 'the signal and telegraph corps ought to be blended together to make them more effective,' and was loud in his praise of what they had already accomplished.

"I also tapped the rebel wire at Midway, S. C. I found Charles Eddy, our chief operator, at General Sherman's headquarters on the same mission about four miles west of me. Our troops as usual destroyed the wire as soon as they came to it, although I thought I could reach the wire several hours before even our enterprising 'bummers' could do so by taking an early start with our escort, but the bummers followed closely in our wake. We were not sorry, however, as we needed their assistance before we reached the railroad. The rebel cavalry gave us several lively fights and the bummers helped us out. During the Savannah and Goldsboro, N. C., campaigns, I performed aide duty for General Howard and was frequently called on for such service, and was more or less under fire, especially at Rivers Bridges, Orangeburg, Columbia, Cheraw, Fayetteville and Bentonville. During this march I prepared by order of General Howard a number of communications in cipher and sent them by scouts to the fleet. Each scout was to receive $100 in gold on the safe delivery of the messages to any officer of the fleet.

"In October, 1866, I was at the request of General Thomas, appointed cipher operator, for the military district of Tennessee, at Nashville, and continued as such to June 30, 1869. During the troublesome municipal affairs in Nashville, in 1867, I rendered good service to General Thomas in concentrating troops at that point, and General Thomas in a letter from his headquarters in Louisville thanked me for the care and order in which I preserved his communications to Washington and to the different commands scattered through Tennesee and Alabama. I also furnished General Thomas later, while he was in command on the Pacific Coast, missing copies of his communications to Washington, retranslating them from copies on file in my possession at that time. His letter acknowledging the receipt of the same was burned in the fire that destroyed other interesting data. Although the letter from General Thomas was directed to me, it was in tone addressed to the whole United States military telegrahp operators.

"As near as I can remember the letter from General Thomas read as follows: 'Accept my thanks for the promptness with which you complied with my request. I feel deeply indebted to the telegraph operators of my late department for the efficient service they rendered me in the campaigns we passed through.'"

(To be Continued.)

Railroad Organization Elects Officers.

The Order of Railroad Telegraphers, Despatchers, Agents and Signalmen, which lately held its convention at Pittsburg, Pa., elected the following board of officers: President, J. D. S. Baird, Philadelphia; grand secretary-editor, J. R. T. Auston, Philadelphia; grand treasurer, James A. Quinn, Philadelphia; first vice-president, George O. Eppenheimer, Frankford, Pa.; second vice-president, C. F. Fortney, Williamsport, Pa.; third vice-president, H. T. Biddle, Elkton, Md.; fourth vice-president, W. J. McCurtan, Olean, N. Y.; fifth vice-president, J. H. Hayes, Elmira, N. Y.; sixth vice-president, Frank L. Thompson, Lakota, Minn.; directors, R. H. Conway, P. D. Sell, S. W. Hiller, R. J. Hunter, G. Pancoast, Amos Strickland.

St. Louis was designated as the point for holding the next meeting, at a date to be hereafter named.

Mr. Collins and Telegraph Age.

Mr. E. W. Collins, superintendent of the Postal Telegraph-Cable Company, at Cleveland, O., writes to this journal as follows:

"I take pleasure in handing you herewith my check for $1.50 to cover a year's renewal of my subscription to Telegraph Age, to which periodical I have been a continuous subscriber for a quarter of a century, with pleasure and profit to myself. While waddling about in its swaddling clothes in the early days the Age received many a bump, but it got 'through trials to glory,' just as I hope you and I will by and by. More power to it!"

Mr. J. M. Maddox, manager of the American District Telegraph Company, San Francisco, Cal., in ordering a renewal of his subscription, recently, wrote: "It has always been a pleasure for me to say a good word for Telegraph Age; it is a habit I have no desire to discontinue, believing that the columns of the paper provide educational features which, if taken advantage of, not losing sight of the fact that proper effort be made in other directions, that chances for advancement or promotion, would be materially increased."

Scorn not the advice of an inferior; the underling of fortune may be, in merit, your superior Situation never determines ability.

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Simultaneous Telephony and Telegraphy.

BY FRANCIS R. HOYT, IN "TELEPHONY."

The repeating coil simplex adapts itself more readily to small plants where the volume of telegraph business is not great enough to demand more than one telegraph message per pair of telephone wires. In cases of greater demand some other form of telegraph circuit must be used, arranged so that a simplex, composite, or if necessary, a polar duplex can be immediately set up and put into practical operation without any change in the ringing circuits of the switchboards. That is, there must be a conformity not only of apparatus, handling, etc., but conformity of operation. As this operation means practically the ringing by operators over these lines, every line should itself control the ringing current it is to furnish at the distant end, and should do so without the operator's knowledge. From this we can see that in cases of composite and polar circuits where high frequency ringing current must be used, the simplex circuit to be used in conjunction with these should also use high frequency current not only in order to keep the test panel as near uniform as possible, but because the cost of installation is no higher, the ringing can be done at a much greater distance, and the efficiency is, if anything, slightly improved. A repeating coil to be of practical use in simultaneous work must adapt itself readily to both ringing and talking; and as any transformed energy must undergo a transformation loss, it is plain that when the repeating coil is taken out of the talking circuit the transmission will be improved. This must not be taken to mean that it is not possible to ring through a repeating coil of this kind with high frequency current; the fact is that using high frequency current on a repeating coil simplex will improve its ringing capacities.

The only objection that can be offered to simplex circuits using the retardation coil is that it cannot be used without a composite ringer, or, in other words, without a high frequency current for ringing; but as this circuit was designed for use in connection with composites, polars, etc., this is immaterial.

The retardation coil used in this circuit has 1,000 ohms resistance and a very high coefficient of self-induction, so that the rapidly vibrating voice currents traveling over the metallic line circuit pass through the condensers and into the switchboard and vice versa, without attempting to thread the retardation coil. A current of very high frequency will always take a path of ohmic resistance in preference to a path of self-induction. Probably the most confusing terms used by the practical telephone man are self-induction and impedance. In simultaneous work especially these terms should be clear to all who have occasion to use them; but unfortunately, like all other theoretical phrases and branches of our business, these terms have been shrouded with mystery, and seem to be beyond the comprehension of the practical electrician. In reality they are very simple, and in this case the whole confusion has been caused by the name given the coil (impedance) which is representing a self-induction unit and not a unit of impedance. For, to be absolutely correct, impedance means, "any opposition to current flow," the theoretical definition of which is, "a quantity expressed in ohms equal to the square root of the sum of the squares of the inductive resistance of the circuit and the ohmic resistance;" or, to use plain terms, it is the sum of the ohmic resistance and the spurious resistance of a circuit expressed in ohms. From this it can be seen that if we had a circuit in which there was condenser, a non-inductive resistance, an inductive resistance and any other resistance offering devices, we could calculate the ohmic resistances of them all, add them and say the impedance of the circuit was of certain amount, expressed in ohms. If alternating current was applied to this circuit (the terms self-induction and impedance never being used except where an alternating or an interrupted direct current is concerned) we would find that there was more retarding effect in the inductive coil alone than in all of the other branches together, which goes to show that the impedance effect is nothing more than the ohmic resistance of the circuit, while the real opposition is in the self-induction of the so-called impedance coil. Self-induction means, the induction of a circuit or coil on itself and should always be expressed in henrys (the unit of self-induction). A peculiarity of the impedance coil is that the opposing power is instantaneous; that is, it is at its full value at the same moment that the impressed current is started or stopped.

So then when it is said that the high frequency voice currents will take the path of the greatest ohmic resistance in preference to a path of any self-induction, it is meant that the voice currents will take the path of the line, condensers, etc., instead of trying to enter the retardation coil. While this coil has a very high resistance, in most cases it is very small as compared with the resistance of the line.

The resistance of a condenser to an altering current of any known period can be calculated by a very complex formula which it is not necessary to consider here, but it might be added that an ordinary two microfarad condenser with a ringing machine offers a resistance of close to 500 ohms and a standard one-microfarad condenser in the same circuit would be about 1,000 ohms. As the resistance of a condenser decreases as the frequency increases, it follows that this same condenser in a talking circuit would offer resistance so very low that it would not prove detrimental to the transmission.

From these explanations of the fundamental principles we can understand just how it is possible for telegraph impulses to be sent over wires carrying a telephone message, and all the elaborate systems are based on these simple foundations.

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The following are a few notes well to remember:

An interrupter for high frequency should give at least 300 pulsations per second.

The operating current of a standard 150-ohm Morse relay is four one-hundredths of an ampere.

Telegraph potential should be five one-hundredths of an ampere at each end of the line.

A standard Morse relay with the armature in contact with the cores has a self-induction of about eight henries.

Increasing the number of composite sets in series decrease the speed of signaling.

A short method of figuring the number of gravity cells necessary (when they are used) on telegraph lines, to give the proper operating current for the relays, is to simply divide the total resistance by twenty-three. The result obtained is the number of cells necessary.

For the number of cells necessary to operate four-ohm sounders, divide the total resistance by two.

The electromotive force of a gravity battery is one and seven hundredth volts; the internal resistance two ohms.

Fessenden's Interference Preventer for Wireless Telegraphy.

Several accounts of tests made with the Fessenden system by the United States Navy representatives have referred to the remarkable immunity secured in working at the same time as other stations close by and with wave-lengths not very different, by the employment of the inventor's so-called "interference preventer," says an English contemporary. Since, however, no details have been published as to the mode of action of this device, there has existed, besides some curiosity as to the means employed, also no little scepticism.

The patent specifications have now been published, and so the principle employed can be described, although there are probably a number of details to which attention has to be paid for successful results to be obtained in practice.

The method is stated to be based upon the fact that resonance curves in general have a curvature of the same sign. Hence, if three circuits having very small damping are carefully tuned, the one circuit to the frequency which it is desired to receive and the other two circuits to a higher and lower frequency, respectively, the two latter circuits can be made to neutralize the effect of disturbing impulses; that is, those not of the desired frequency, caught by the properly tuned aerial and which otherwise would be heard in the receiving instrument.

Though in practice a single vertical antenna is employed, connected to three separate tuned circuits, it is preferred to describe the arrangements as applied to the case where three separate antennae are used to arrive at the same result. Here the three receiving antennae which we will call A_1, A, A_2 are tuned, A to the frequency at which it is desired to receive, A_1 to a somewhat higher and A_2 to a somewhat lower frequency. Each aerial circuit contains a detector, which is preferably a solid barretter, and the necessary cell and potentiometer arrangement. The receiving or, rather, indicating instrument is a telephone having four coils, two on each limb of the magnet. Calling these coils C_1, C, C, C_2 to correspond with respective aerial circuits it is arranged that one pair, CC, is in circuit with the correctly tuned antennae A, and one each of the other coils, namely, C_1, C_2, with antennae A_1, A_2 respectively. These two latter coils are arranged so that their windings oppose the action of those of the coils CC, and they are made somewhat weaker than these coils (fewer turn). It will be seen that on a disturbing impulse striking all three antennae this will, if not in tune, produce nearly equal effects in the barretters, and hence these effects will neutralize each other as regards their effect on the diaphragm of the telephone. If, however, the oscillations are of the proper frequency, the barretter in the antenna circuit A will be very much more strongly affected than either of the others, and the telephone diaphragm will be actuated.

This effect can be enhanced by making the damping of the circuits A_1 A_2 somewhat greater than that on circuit A. Still further security against disturbances can, if desired, be obtained by having recourse to mechanical means depending upon the use of group frequencies; several arrangements by Professor Fessenden with this aim in view are already well known.

The adjustment of the relative strength of the coils is, of course, the most important point, and as regards this it is stated that the balancing can be effected by calculation or trial, or by a combination of both.

The arrangement is thus, on the whole, very simple, while the test results have shown that it is effective. It will doubtless be argued in this country that an unnecessary complication has to be added to the existing wireless equipment. But Professor Fessenden—who can scarcely be considered as a disbeliever in the future of wireless telegraphy—states, with some directness, that mere tuning to the wave-frequency, however careful such tuning may be, does not sufficiently ensure against interruption from disturbing sources, and especially where the number of closely adjacent stations is considerable.

It appears from this that it is the more severe working conditions prevalent in America which have necessitated the development of a self-protective system such as we have scarcely found necessary as yet in this country, where the stations are but little closer now than in the days when it was admitted that interference could not be prevented. In any case, since the British Isles are not very large there will probably come a time, if the use of wireless telegraphy continues to advance at its present rate, when some special device for preventing interference from neighboring stations cannot well be dispensed with.

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Reminiscences of the Reporters' Gallery at Washington.

Within the once familiar precincts of the press gallery of the House of Representatives I felt as Rip Van Winkle must have felt—only more so, for Rip slept but twenty years, and it is nearly forty since I was one of the "boys" who from their perch above the Speaker's chair kept tabs on what Congress was doing. To work in another simile, I was like a cat in a strange garret, for there was not one familiar face or object, and the furniture and fittings were palatial compared with the bare room back of the gallery in which the old-timers used to congregate when nothing was doing in the House. I gained admission to these sacred precincts by presenting my card, with the statement that I was a member of the first committee in charge of the gallery, and this proved an open sesame. When James G. Blaine was elected Speaker of the House in 1869, he sent for George W. Adams, the correspondent of the New York World, and said to him that if the correspondents would appoint a committee to take charge of the press gallery (it was called the reporters' gallery then) he would turn its control, vested in him, over to them, and they could make such regulations regarding admissions, etc., as they saw fit. The correspondents met and elected as such committee George W. Adams, General H. V. Boynton and Charles A. Pilsbury, and the latter is to-day the only survivor. Of the fifty or sixty correspondents then eligible to the privileges of the gallery only two are now on the roll —William B. Shaw, of the Philadelphia Enquirer, and W. C. McBride, of the Cincinnati Enquirer. Mr. Shaw even then was known as the "Nestor of the Row" (Newspaper Row on 14th street, now a thing of the past) and is said to be practically on the retired list, but McBride, a younger man, is still the active head of the Cincinnati Enquirer's Washington bureau.

The reporters' gallery of the early days—the old name comes most readily—was smaller than it is to-day and the room back of it contained only a bare table and some chairs. There was a large mirror in a gilt frame, before which the occasional lady correspondents used to prink and the "boys" adjust their neckties, but otherwise the walls and the tiled floor were bare. In the corridor adjoining was the Western Union telegraph, where to-day may be seen, as in the early days, "Ham" Young, one of the most popular operators Washington has ever known, and who is still alert and vigorous. Fred Royce, Morell Marean, and many other operators well known to newspaper men of the late '60's and the early '70's, have all passed away.

The gallery for a number of years past has been in charge of Charles H. Mann—Charley Mann the boys call him—and the changes made during his administration have been many and important. Practically the whole corridor is used now. There are two long tables instead of one, and they are supplied with stationary, ink, pens, scissors, mucilage, directories and other books of reference. Upholstered seats have been placed in the window recesses, the floor is carpeted, and the walls hung with portraits of newspaper proprietors. I should much rather have seen portraits of the men whose work was done in this gallery. Opening from this room is a smaller room containing a lounge and easy chairs, and the Western Union has its operators as usual in the corridor outside. Near at hand is another room for the use of the correspondents, in which ten typewriters—the machines, not operators—are at the correspondents' disposal. In the old days correspondents had to provide their own stationery, carrying it with them or keeping a supply in their desks in the reporters' gallery. The telephone was not known then, and the typewriter had not come into general use. To ascertain what was going on in the Senate involved quite a walk from the House side, including the descent of one stairway and the ascent of another, and to communicate with the office on 14th street called for a walk or a car ride of nearly a mile. Now the telephone puts you in touch with everybody, everywhere, and the typewriter copy is a boon to compositors and telegraph operators. "Charley" Mann pleads guilty to being a Democrat, which is natural enough as he comes from the Democratic city of Baltimore, but he has the whole corps of correspondents back of him, and the only attempt made to displace him ended in signal failure. He is a cyclopedia, a gazateer, a directory, and a good fellow, and is likely to hold his job for life.

Forty years ago those entitled to admission to the gallery numbered about fifty, and to-day there are about 180. While I cannot speak advisedly on this point, I am inclined to think that the incomes of the lesser number aggregated as much as those of the greater number now. It was easy to make $100 to $150 a week. Most of the large dailies paid at least $10 a column, and some of them twice that. The Chicago Tribune paid George Alfred Townsend $20,000 for one thousand columns to be contributed within three years at the rate of three hundred columns a year. It was customary when a correspondent went away for a long or short outing to turn over his whole salary to the man who did the work during his absence; and in the summer time, O. K. Harris, who was associated with Frank A. Richardson in reporting the proceedings of Congress for the Baltimore newspapers, derived a princely income from this source. For some time the leading dailies paid William B. Shaw a weekly salary for getting committee news, and I am not sure but that included the proceedings of the executive sessions of the Senate. The story is told that at a dinner party after one of these executive sessions a Senator said: "Well, Shaw, what was done in executive session to-day?" Shaw shook his head and replied: "I can't tell you, you Senators are too leaky." It was not very difficult, however, to get at what was done

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in executive sessions, despite the precautions taken by the Senate to preserve secrecy. Some Senators felt, no doubt, that the public had a right to this information; and I have one Senator in mind who was notoriously "leaky," but I believe unconsciously so; and on one occasion he began to discuss the executive proceedings in open Senate and was shut off by a colleague. A chapter might be written on this phase of Congressional reporting.

It does not seem as though The Associated Press of those days was as strong a competitor of the "specials" as it may be to-day. "Father" Gobright, its head, was very conservative and the matter he sent out was mainly of a routine order, and it was generally known to the specials what was going over the wires to The Associated Press so that they need not duplicate. Under President Johnson, W. W. Worden, then the Washington correspondent of the Baltimore Sun, had a practical monopoly of the White House news and dealt it out as he saw fit. Now the news appears to be bulletined largely, so that "beats" must be more difficult than formerly, and most of the departments and bureaus send out typewritten matter to newspapers all over the country—such matter as used to make "stories" that were profitable to the special correspondents.

Perhaps I should not have been surprised at finding so many young men in the press gallery. Come to think of it I was once young myself. One to whom I was introduced was born the year I came to Washington, and the majority were not born when I began writing for the press fifty-one years ago. I often think that had I remained at the National Capital I should, like all save one or two of my associates, have long since joined the silent majority.

In looking down upon the House in session there was not in evidence a single familiar face outside of the Maine delegation. Think of the men who have gone. I shall not attempt to name them in chronological order or to give a complete list, but simply mention those who happen to come to mind. Naturally, James G. Blaine comes first, not only because in ability he ranked above his contemporaries but because he was the best friend the newspaper men in Washington had in my day. He had been a newspaper man himself, and a good one, and was always helpful in imparting information, in suggestions and in words of encouragement. Then—always a conspicuous figure—there was Ben Butler with his unlighted cigar; General Banks, whose hair was observed to change gradually from coal black to snow white, when he gave up the use of dye; Alexander H. Stephens of Georgia in his wheel chair, frail in body—in fact, a living skeleton—but whose coal black eyes blazed like fire when he was aroused; "Sunset" Cox, everybody's friend, with newspaper men a specialty; Mungen of Ohio, whose speech on Senator Sumner was expunged from the record; Proctor Knott, whose famous Duluth speech and his no less witty speech on the District of Columbia appropriation bill I had the pleasure of hearing; Dan Voorhees, the "Tall Sycamore of the Wabash," later a member of the Senate; Sam Randall, a Democrat who represented a Republican district, and who led the memorable fillibuster on the force bill, when the House was in continuous session for some forty-eight hours; gallant Phil. Cook of Georgia, an ex-Confederate who bore many severe wounds, and who at the time of the Hayes-Tilden contest, when there was much talk of a resort to arms, said if the northern Democrats wanted to fight they could do so, but he had had all the fighting he wanted; "Pig Iron" Kelley, the high priest of protection; little Dickey, Thad. Stevens' successor, who only rose in the House to say "I object;" James Brooks, editor of the New York Evening Express, a native of Maine, whose last years were clouded by the Credit Mobilier scandal; John Morrissey, ex-pugilist, whose gambling house on E street near 14th was much frequented by the statesmen of that day. But it is time to call a halt. To name all the dead and gone statesmen who held the boards from '69 to '79 would outrun the space at the disposal of a country editor, who must have regard for the local news of his vicinity.—C. A. Pilsbury in The Republican Journal, Belfast, Me.

True Courtesy Pays.

The Delaware, Lackawanna and Western Railroad is noted for the excellence of its train service, its fine suburban service being especially commendable. The desire to serve the public acceptably is doubtless fostered by the spirit that formulated and issued a circular such as the following for the guidance of employes:

The principle that underlies courteous treatment of others is simply that of doing unto others as you would they should do unto you.

In a highly complex and technical business such as that of the railroad, there are many things that you, with your training and daily experience, understand with perfect familiarity, but which the public do not understand; therefore, do not assume that the public should comprehend them without asking questions, but when they make inquiry of you give them the courtesy of a reply just as full and clear as you can make it, without any suggestion of superiority born of a greater knowledge.

Words are only one means of expression, and manner is quite as important; therefore remember that a kindly and gracious manner is not only the sign and mark of a self-respecting man, but is to your words what oil is to machinery in making them move effectively to their purpose.

True courtesy is no respector of persons. It gives the civil word and the helping hand quite as readily to the ill-clad stranger as to an official of the company.

Courtesy is not only something the public have a right to expect of you, but it pays. It pays in the friends it makes you personally and as a representative of the company. It pays in minimizing the friction of your life, as well as that between the company and its patrons. It pays in raising your standing with the company.

It is the wish of the management of this company that all its representatives, whose work brings them into contact with the public, may appreciate and fully measure up to their duty and privilege in this respect.

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THE RAILWAY TELEGRAPH SUPERINTENDENTS MEET IN CONVENTION.

When an association which has the telegraph for its basis of organization, an interest which also serves as the bond holding it in continuous fellowship, has so far passed its twenty-fifth anniversary as to be well advanced toward that of its thirtieth, it may well be said that it is getting on in years. If multiplicity of years afford any indication of wisdom, of dignity and of respectability, then the Association of Railway Telegraph Superintendents is all of these, especially when, as if "by their fruits ye shall know them," the record is one of

EDWARD P. GRIFFITH, OF NEW YORK.
President of the Association of Railway Telegraph Superintendents.

growth, of expansion and well doing. When train despatching by telegraph came into existence, then the germ of the railway telegraph superintendent made its appearance. The present association is the outgrowth of a need that has found expression, development and promotion in answering to the demands of the service. How well the superintendents have met the exigencies of the situation, the demands placed upon them is a matter of record.

The railroad telegraph service has produced some of the brightest men in railroad economy. The tendency has been, by virtue of the dignity of the calling itself, to instruct and elevate the individual, so that in every grade of the service, reaching up to the highest executive heads of many of our most important systems of railway, the successful telegrapher is to be found. It is a fine exhibit he has made, alike of mentality and executive force, and nothing that may be said can add to the strength of the thought and lesson to be derived therefrom than is expressed in the statement of the simple fact itself. The responsibilities attaching to this important office in railroad operating are many. To meet these demands the services of men of intelligent minds and progressive ideas are required—men who are quick to discern not only the needs of to-day but the necessities of to-morrow. By reason of the consolidation of interests and merger of lesser systems of railroads into vast and far-reaching extensions, the office of superintendent of telegraph is becoming correspondingly enlarged. Never before in the history of railroading has the accountability of the superintendent been so great as now. Hence it is that the importance of the annual convention regarded as an educational factor, has steadily advanced from year to year. The papers that are read at these conferences, and the wide range of discussions that has followed weighty presentations, abundantly testify to this fact. The good this association has wrought is too obvious to require enumeration. When such manifest benefits are to be secured it is to be regretted that the association does not number within its membership accredited representatives from every railroad system in this country. It is a question, indeed, whether any railroad can afford properly to hold aloof from the assistance such an association offers. Especially is this true at this time, when so much that is new in practice is coming up for consideration, and acceptance.

National and state legislation, of a character designed ostensibly to regulate, lessen and, no doubt, make easier, the working hours of railroad telegraph operators, has nevertheless, because of superficial knowledge of governing conditions in the legislative mind, shot wide of its mark, for it has been the means rather of befogging the situation so far as conferring benefits on the individual is concerned. What it has accomplished, however, is to hasten the time when the telephone shall virtually supersede the telegraph in train despatching The movement in this direction is becoming general and the change from one system to another, wherever adopted, has worked results that thus far have more than realized expectations, meeting

WILLIAM J. CAMP, OF MONTREAL, QUE.
Vice-President of the Association of Railway Telegraph Superintendents.

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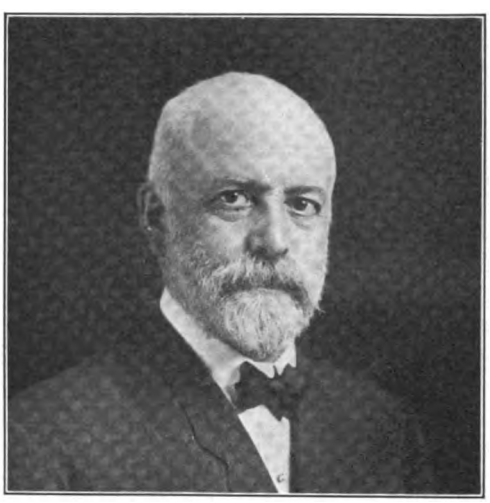
with hearty approval. From a means employed first as auxiliary to that of the telegraph, it would appear now that, having passed the experimental stage, the telephone was to advance to first place and become installed as the fundamental method of train operating. So radical a change from former conditions introduces a question of the highest practical import in railroad operating, and it is natural therefore that the matter should receive much attention from the superintendents at the convention now at hand. The published news in our railroad columns of late bear evidence of the changes in thought and fact that have occurred respecting train despatching methods. The record is one of interest and indicative of future and wide-expanding achievement in this particular field.

As an evidence of the increasing value of the annual conventions of the Association of Railway Telegraph Superintendents, the meeting this year, which occurs at Montreal, Que., will cover a period of four days, instead of the usual three, the dates being Wednesday, Thursday, Friday and Saturday, June 24, 25, 26 and 27. It will be the twenty-seventh of the series, and the second time since the formation of the organization, which occurred at Chicago, November 22, 1882, that Montreal has been selected, the first date being June 12, 1895, thirteen years ago. Headquarters will be established at the Windsor Hotel. This famous hostelery is conducted on the European plan. The following schedule of prices has been adopted: Single room, without bath, $2; with bath, $2.50; two occupying a room, without bath, $3; with bath, $4. Meals, a la carte. No charge will be made for exhibits, if located in the rooms of the exhibitors.



P. W. DREW, OF CHICAGO, ILL.
Secretary and Treasurer of the Association of Railway Telegraph Superintendents.

Intending exhibitors of apparatus of whatever nature are advised that by authority of the Canadian collector of customs all such exhibits will have to be covered by regular invoices and entry passed in the usual manner, but the duty, if collected, will be refunded on the apparatus being returned to the United States. All those bringing in such apparatus should provide themselves with invoices in triplicate, and also, before leaving the United States, should make a declaration to the United States customs that the instruments are to be returned there, in order that they will not have to pay duty to the United States customs on re-entry. Duty will have to be paid on any souvenirs intended for distribution at the convention.

It is expected that members, as is customary, will provide themselves with railway transportation through the usual channels.

The Pullman Company makes the following announcements to the superintendents: "We will take pleasure in extending to delegates and dependent members and their families the same courtesies as heretofore, namely, delegates to pay full fare en route to Montreal, and on presenting receipts showing fare paid, together with proper credentials of the association, also a letter from the proper official of the railroad with which each delegate is connected, identifying them as regular salaried employes, in active service, and who fall within the limitations of the Interstate Commerce Law, to our Mr. W. A. Ritchie, district superintendent, Montreal, passes will be issued for the return trip."

While the business that calls the superintendents together at Montreal, to which city the Mayor will deliver an address of welcome, will absorb a very large share of their allotted time, an attractive programme for their social entertainment and that of the ladies and other guests of the party, has been arranged. This has been done under the supervision of W. J. Camp, vice-president of the association, and electrical engineer of the Canadian Pacific Railway Company's Telegraph, and W. W. Ashald, superintendent of telegraph of the Grand Trunk Railway system. Both of these gentlemen, who reside in Montreal, have been indefatigable in their efforts to extend an engaging hospitality to their visiting associates. The plan in brief outline will include a trolley ride about the city of Montreal; then the Canadian Pacific Railway has courteously offered to provide transportation for an excursion from Montreal to Quebec and return. Besides this the Richelieu and Ontario Navigation Company has agreed to furnish transportation at half rate over any part of their system which the superintendents may desire to travel, either from Toronto or Kingston to Montreal, or for side trips to Quebec or up the celebrated Saguenay River. Prices have been fixed as follows: Toronto to Montreal, $5; Kingston to Montreal, $2.75; Montreal to Quebec, $2.25 one way, return $4.25; Quebec to the Saguenay and return, $4.50. Meals and berths will be extra: dinner, one dollar; breakfast and supper, seventy-five cents each; berths in outside rooms, one dollar per night. In order to obtain advantage of these rates members will be required to show certificates of membership when purchasing their tickets.

An excursion will be made by the Grand Trunk

(Continued on page 414.)

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WALLACE W. RYDER.
Superintendent of Telegraph, Chicago, Burlington and Quincy Railroad, Chicago, Ill.

N. E. SMITH.
Superintendent of Telegraph, New York, New Haven and Hartford Railroad, New Haven, Conn.

J. S. STEVENS.
Superintendent of Telegraph, Chesapeake and Ohio Railway, Richmond, Va.

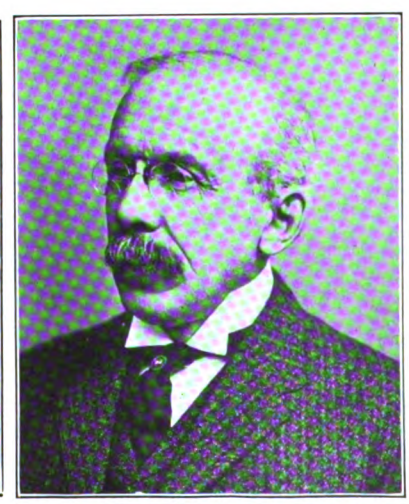
W. P. CLINE.
Superintendent of Telegraph, Atlantic Coast Line Railroad, Wilmington, N. C.

C. P. ADAMS.
Superintendent of Telegraph, Southern Railway, Washington, D. C.

JOHN L. DAVIS.
Superintendent of Telegraph, Chicago and Eastern Illinois Railroad, Chicago, Ill.

ISAAC T. DYER.
Superintendent of Telegraph, San Pedro, Los Angeles, and Salt Lake Railroad, Los Angeles, Calif.

F. L. BLENDINGER.
Assistant to First Vice-President and Superintendent of Telegraph, Lehigh Valley Railroad, New York.



M. MAGIFF.
Superintendent of Telegraph, Central Vermont Railway, St. Albans, Vt.

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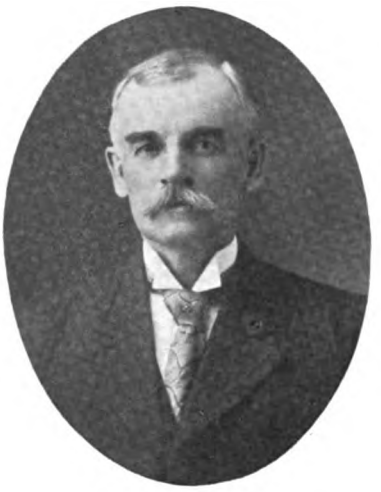
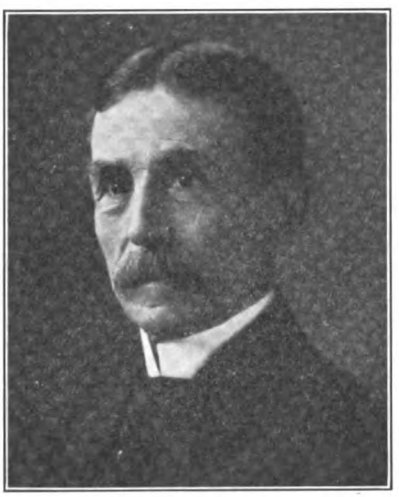
GEORGE C. KINSMAN.
Superintendent of Telegraph, Wabash Railroad, Decatur, Ill.



E. E. TORREY.
Superintendent of Telegraph, Mobile and Ohio Railroad, Jackson, Tenn.

CHARLES SELDEN.
Superintendent of Telegraph, Baltimore and Ohio Railroad, Baltimore, Md.



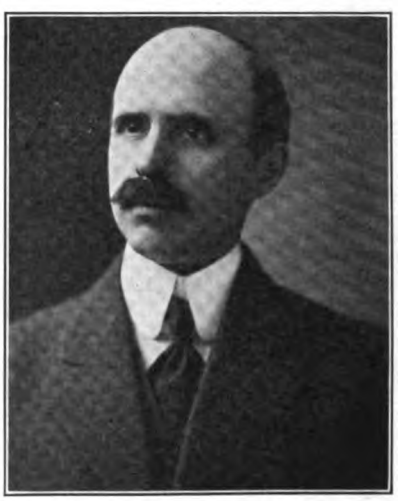
OSCAR C. GREENE.
Superintendent of Telegraph, Northern Pacific Railway, St. Paul, Minn.

A. B. TAYLOR.
Superintendent of Telegraph, New York Central and Hudson River Railroad, New York.

FRANK H. VAN ETTEN.
Superintendent of Telegraph, Southern Indiana and Illinois Southern Railway, Chicago, Ill.

CHARLES M. LEWIS.
Superintendent of Telegraph, Philadelphia and Reading Railway, Reading, Pa.

S. L. VAN AKIN, JR.
Assistant Superintendent of Telegraph, New York Central and Hudson River Railroad, Syracuse, N. Y.



L. S. WELLS.
Electrical Superintendent, Long Island Railroad, New York.

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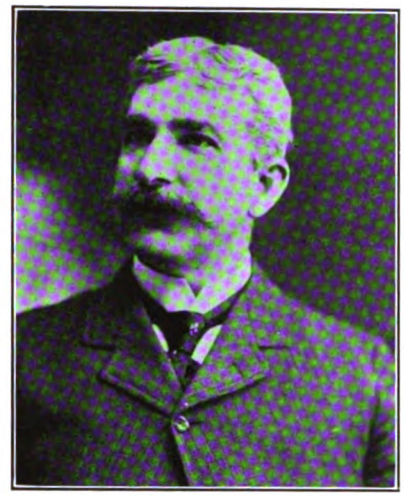
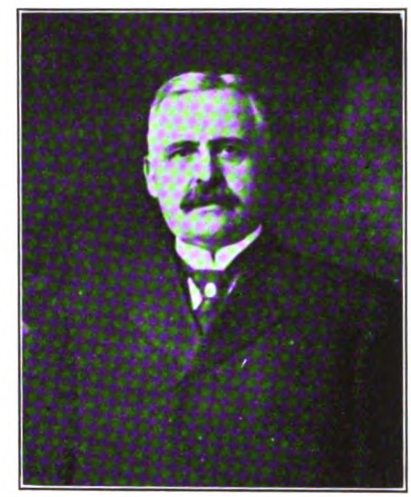
EDWARD A. CHENERY.
Superintendent of Telegraph, Missouri Pacific Railway, St. Louis, Mo.



W. F. WILLIAMS.
Superintendent of Telegraph, Seaboard Air Line Railway, Portsmouth, Va.



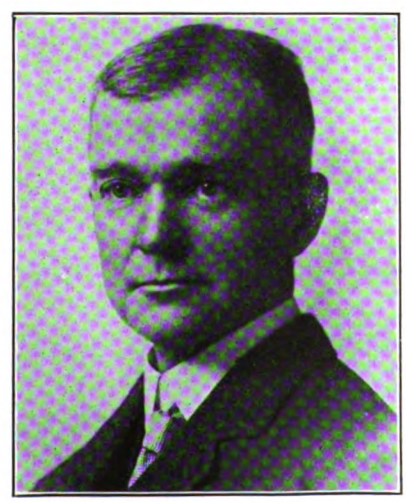
E. H. MILLINGTON.
Superintendent of Telegraph, Michigan Central Railroad, Detroit, Mich.

EDGAR A. KLIPPEL.
Superintendent of Telegraph, Oregon Railroad and Navigation Company, Portland, Ore.

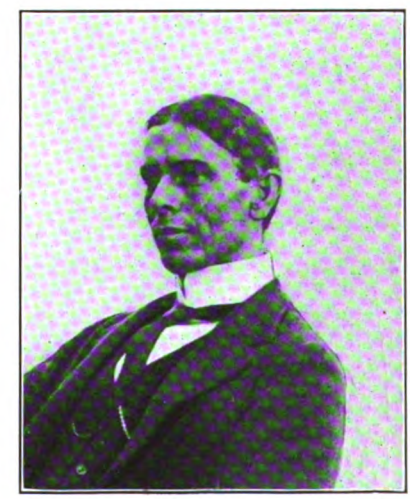
FREDERICK E. BENTLEY.
Superintendent of Telegraph and Telephones, Terminal Railroad Association, St. Louis, Mo.

JOHN M. WALKER.
Superintendent of Telegraph, Denver and Rio Grande Railroad, Denver, Col.

WM. W. ASHALD.
Superintendent of Telegraph, Grand Trunk Railway System, Montreal, Que.



VICTOR T. KISSINGER.
Assistant Superintendent of Telegraph, Chicago, Burlington and Quincy Railroad, Lincoln, Neb.



R. L. LOGAN.
Superintendent of Telegraph, Kansas City Southern Railway, Kansas City, Mo.

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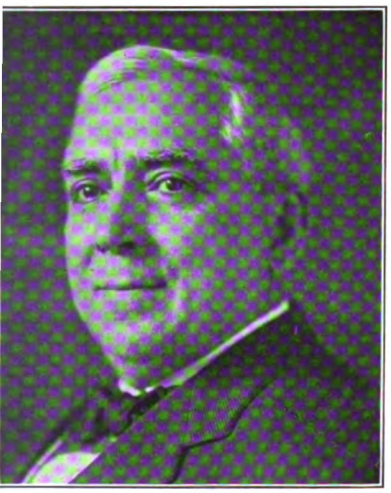
J. L. HENRITZY.
uperintendent of Telegraph, Colorado and Southern Railway, Denver, Col.

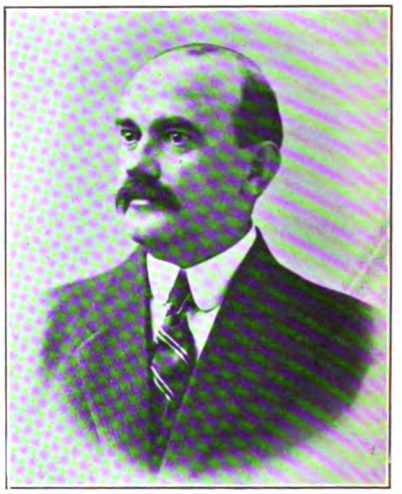
G. H. GROCE.
Superintendent of Telegraph and Signals, Illinois Central Railroad, Chicago, Ill.

C. A. PARKER.
Superintendent of Telegraph, Denver, Northwestern and Pacific Railway, Denver, Col.



GEORGE A. CELLAR.
uperintendent of Telegraph, Pennsylvania Lines West of Pittsburg, Pittsburg, Pa.

B. F. FROBES.
Superintendent of Telegraph, Oregon Short Line Railroad, Salt Lake City, Utah.



W. C. WALSTRUM.
Superintendent of Telegraph, Norfolk and Western Railway, Roanoke, Va.

U. J. FRY.
Superintendent of Telegraph, Chicago, Milwaukee and St. Paul Railway, Milwaukee, Wis.

L. B. FOLEY.
Superintendent of Telegraph, Delaware, Lackawanna and Western Railroad, New York.

C. H. GAUNT.
Assistant General Manager and Superintendent of Telegraph, Atchison, Topeka and Santa Fe Railway, Topeka, Kans.

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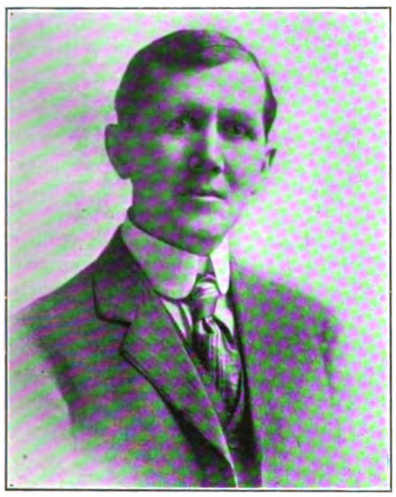
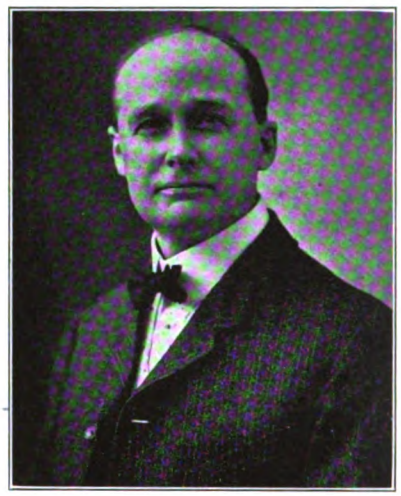
S. A. D. FORRISTALL.
Superintendent of Telegraph, Boston and Maine Railroad, Boston, Mass.

H. C. HOPE.
Superintendent of Telegraph and Signals, Chicago, St. Paul, Minneapolis and Omaha Railway, St. Paul, Minn.



S. K. BULLARD.
Superintendent of Telegraph, Missouri, Kansas and Texas Railway, Sedalia, Mo.

JOHN B. SHELDON.
Superintendent of Telegraph, Union Pacific Railroad, Omaha, Neb.



F. G. SHERMAN.
Superintendent of Telegraph, Central Railroad of New Jersey, New York.

C. S. RHOADS.
Superintendent of Telegraph, Cleveland, Cincinnati, Chicago and St. Louis Railway, Indianapolis, Ind.

A. E. ROOME.
Superintendent of Telegraph, Southern Pacific Company, San Francisco, Cal.

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(Continued from page 408.)

Railway on Wednesday afternoon, June 24, which will convey the visitors from Montreal to Lachine, where they will board a steamer and shoot the Lachine Rapids. Besides this a special electric train will be placed at the disposal of the association for a trip from Quebec to St. Anne de Beaupre (a celebrated shrine), and which, on its return, will stop at the beautiful Montmorency Falls.

A visit to Quebec, planned for Friday night, June 26, will hold especial attractions for many, inasmuch as that quaint and historic old city presents so much that is of interest in its ancient style of architecture, dating back to a by-gone age, French in its individuality, so utterly different from anything of that nature to be met with elsewhere on this continent. The Chateau Frontenac affords the best accommodations to travelers.

From all that has been indicated it will be observed that there is evidence in abundance that the leisure hours of the railroaders and their friends will be abundantly provided for during their Montreal visit, and it is safe to say that time will not hang heavily on their hands.

The committee of arrangements, which has control of all matters pertaining to the entertainment of the visiting superintendents, is composed of the following: W. J. Camp, electrical engineer, Canadian Pacific Railway Company's Telegraph, Montreal, chairman; W. W. Ashald, superintendent of telegraph, Grand Trunk Railway, Montreal; E. H. Millington, superintendent of telegraph, Michigan Central Railway, Detroit; G. C. Kinsman, superintendent of telegraph, Wabash Railway, Decatur, Ill.; M. Magiff, superintendent of telegraph, Central Vermont Railway, St. Albans, Vt.; S. A. D. Forristall, superintendent of telegraph, Boston and Maine Railway, Boston, and N. E. Smith, superintendent of telegraph, New York, New Haven and Hartford Railway, New Haven, Conn.

The ladies' committee, which is now arranging for the reception and special entertainment of the ladies of the visiting party, is made up as follows: Mrs. W. J. Camp, chairman; Mrs. James Kent, Mrs. W. W. Ashald, Mrs. M. Magiff, Mrs. J. F. Richardson, Miss Amy Jennings, Mrs. Thomas Rodger and Miss Gladys Camp.

The papers to be read at the convention embrace the following:

"Dry Batteries on Telegraph Circuits," by U. J. Fry, of Milwaukee; "Reduction of Telegraphing by Use of Printed Forms," by O. C. Greene, of St. Paul; "Commercial Reports," by G. C. Kinsman, of Decatur, Ill.; "Wiring of Station Buildings from the Contractor's Standpoint," by J. H. Jacoby; "Adverse Railroad Legislation," by E. A. Chenery, of St. Louis; "My Experiences While in Charge of Telegraph Work on the Isthmus," by C. F. Annett, of Goldfield, Nev.; "Qualifying Operators for Train Despatching," by C. S. Rhoads, of Indianapolis; "Selecting Operators for Railroad Use," by L. H. Korty, of Omaha; "Moving Trains by Visible Signals," by L. B. Foley, of New York; "Block Signals," by H. C. Hope, of St. Paul; "Use of Telephones in Connection with Train Movements," by W. W. Ryder, of Chicago; "The Interstate Commerce Commission," by Charles Selden, of Baltimore; "Past, Present and Future of the Association of Railway Telegraph Superintendents," by W. F. Williams, of Portsmouth, Va.; "The Telephone," by F. F. Fowle, of Chicago; William Maver, Jr., of New York, will, it is expected, read a paper on a topic yet to be announced.

Officers will be chosen at the Montreal meeting to succeed E. P. Griffith, superintendent of telegraph, of the Erie Railroad, New York, president; William J. Camp, electrical engineer of the Canadian Pacific Railway Company's Telegraph, Montreal, Que., vice-president, and P. W. Drew, superintendent of telegraph of the Wisconsin Central Railway, Chicago, secretary.

SOMETHING ABOUT MONTREAL.

To an American who never has visited Montreal, a statement of the size and importance of that commercial port, the chief in Canada, together with a reference to its architectural attractions and of its beauty of location and environment, will be likely to arouse pleasant surprise on the part of the uninformed, to invest the old town with especial interest and stimulate a desire to view such a great and inviting center, now containing a population approximating 350,000.

There are many points of difference of course between this fair Canadian metropolis and a city of the United States, but the bustle and activity incident to the one is observable in the other. With all their points of dissimilarity both are intensely American in the broad acceptance of that term.

Situated at the head of ocean navigation, distant nearly one thousand (986) miles from the sea, on an island about thirty miles in length and some seven miles wide, lying at the confluence of the St. Lawrence and Ottawa rivers, Montreal presents a beautiful appearance as it rises terrace on terrace, surmounted by Mount Royal Park, an enclosure of over four hundred acres, at the commanding altitude of seven hundred feet above the water. As may be imagined, the view from this height is extensive and magnificent, reaching far up and down the broad St. Lawrence, and its noble tributary, the Ottawa. It is a view that the excursionists of the convential party will enjoy and long remember.

Montreal is an old city. The site upon which it is built was first visited by the white man in 1535, when the French explorers under Jaques Cartier, landed on the island. The founding of the place, however, occurred over a century later, in 1642, so that Montreal ranks, after the early Spanish occupations in Mexico, as one of the oldest settlements on this continent. While there is much about Montreal that distinguishes the modern town, with its splendid streets and massive buildings, there is also much to be ob-

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served that is quaint and old, reminiscent of other days and of another race. One thing that impresses Americans in the architectural features of the city are the numerous churches, particularly those of the Roman Catholic denomination, for it must be remembered that the French element, who profess that faith, constitute a large proportion of the city's population. Many of these places of worship are of great size and stately in design.

The public buildings, notably the city hall, the court house and others; the railway terminals, a number of hotels, hospitals and numerous business structures, etc., are all metropolitan in their characteristics. A marked feature of the landscape about Montreal is the great Victoria Bridge which stretches its long line of 9,184 feet across the St. Lawrence. The Lachine Rapids, which it is proposed the superintendents and their friends shall visit, are located at a point in the St. Lawrence just above the city. Here the river contracts within a half-mile width and makes a rapid descent over a ledge of rock at a speed of eighteen miles an hour. "Shooting the rapids," as it is called, constitutes one of the exhilarating features of St. Lawrence navigation.

Montreal will intensely interest the stranger, and one is likely to bring away and retain pleasant memories of a visit to that place.

EXHIBITS AND REPRESENTATIVES AT THE CONVENTION.

Besides the active members of the Association of Railway Telegraph Superintendents, which is limited to superintendents themselves, the association has a numerous honorary and associate membership. Embraced among the latter are many manufacturers and manufacturers' agents, whose products find usage in the broad field of the telegraph and in train despatching. In accordance with custom there will be exhibited at the convention a number of devices which will in their unique adaptability for the purposes designed, appeal with special significance to the consideration of the superintendents. For instance, the Western Electric Company of New York and Chicago will exhibit a full line of their well known telephone apparatus, both for use on regular telephone lines and in connection with composited telegraph lines. A full line of their standard telegraph apparatus will be shown and an exhibit of the telephones and selective apparatus used in connection with the despatching of trains by telephones. This portion of the exhibit will be arranged so that it will show the actual operation of the selective devices and in this way demonstrate the advantages of this class of service. The exhibit will be in charge of Mr. W. E. Harkness, sales engineer, of New York, assisted by Mr. M. E. Launbranch, of New York, and Mr. C. L. Howk, of Chicago. The Northern Electric and Manufacturing Company, the Canadian branch of the Western Electric Company, will be represented by Mr. Paul F. Sise and Mr. H. D. Crouch.

Mr. John Langan, of the Okonite Company, New York, will be present at the convention as usual to represent his company's interests, whose wires and tapes, Okonite and Manson and Candee weather-proof wires are recognized as standard products. It will be remembered that Mr. Langan was last year made an associate member of the association at the meeting at Atlantic City.

Mr. John J. Ghegan, of New York, president and general manager of J. H. Bunnell and Company, Inc., than which there is no better or more favorably known manufacturing concern of telegraphic supplies, will be present at the convention.

Mr. G. M. Dodge, president of Dodge's Institute of Telegraphy at Valparaiso, Ind., will be among those in attendance at the convention. He calls attention to the fact that he is able at most all times to furnish competent telegraphers, agents' assistants, helpers and others who would, in every way, be proficient and capable. This institution points with pride to its graduates. Students at this school failing to meet moral requirements, and who lack capability, are not recommended. The annual enrollment is 500, and correspondence is solicited.

The Sandwich Electric Company, of Sandwich, Ill., manufacturers of railway composite apparatus, will be represented by Mr. H. O. Rugh, the engineer of the company. The exhibit of this concern will include their improved system in telegraphy, displaying the various types of their well-known telegraphone, an instrument in which the howler call device is utilized with marked advantage. These will be set up and shown in operation. Their new selective call designed to operate upon either single or metallic circuits, may also be studied in this combination to the best advantage.

Another exhibit may be placed by the Yetman Typewriter-Transmitter Company, formerly of New York, but now of North Adams, Mass., the showing to consist of the well-known transmitter bearing the name of Yetman. The utility of this transmitter in promoting good telegraph service on the railroads is well known from the fact that the machine is used on numerous railroad systems. Mr. Yetman has shown an interest in meeting personally with the superintendents at several former conventions, and hopes to be in attendance at that which assembles on the twenty-fourth instant.

The United States Electric Company, 95 William street, New York, will be represented at the convention by Edwin R. Gill, inventor and electrical engineer of the company; Harrison Osborne, secretary, and Howard E. Merrell, the general manager. Its exhibit will be in conjunction with that of the Western Electric Company. It will consist of a complete circuit for selective telephone calling as now in use on several leading trunk lines of railroad; of another circuit showing the adaptability of the instrument to rapid single or multiple calling on telegraph lines,

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WIRES

KERITE

INSULATED WIRES AND CABLES

Kerite

"the insulation which has withstood successfully the test of half a century." Kerite insulation is a combination of crude Kerite with the finest Para rubber. Kerite preserves the rubber, and Kerite itself has proved *its* wonderful durability by the actual test of fifty years.

Kerite

wires and cables installed half a century ago are in service now.

AERIAL :: UNDERGROUND :: SUBMARINE

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CABLES

TELEGRAPH; TELEPHONE;
SIGNAL; POWER;
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EY SOLE MANUFACTURER
HUDSON TERMINAL · CORTLANDT BLDG
NEW YORK

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and a number of sets of instruments showing their use for telegraph purposes, all with answer-back attachments. A recommending feature in the Gill selector is its adaptability to rapid multiple calling. By its use on a circuit the despatcher can call one or all the stations, by one operation simply, and in a very few seconds of time. Keys corresponding to the stations the despatcher wishes to call are pressed down, the automatic calling device is then started and all the stations desired are readily called by means of that single operation.

The Stromberg-Carlson Telephone Manufacturing Company, of Rochester, N. Y., and Chicago, will make a display at the convention, of their magneto despatching telephone system, and in addition will show their telegraph signal system which acts in conjunction with the telephone for steam railroad signaling service. Practical demonstrations will be afforded by this exhibit.

Mr. E. W. Vogel, of the Railroad Supply Company, of Chicago, an associate member of the association, and between whose company and the railroads there has long existed close relations of reciprocity, is expected to be present at Montreal and there renew an acquaintance with the superintendents which has been regularly cemented each year at these annual reunions.

The selector as an instrument of use in connection with train despatching by telephone, is likely to receive especial consideration in the discussions among the superintendents at the business sessions of the convention. Elsewhere in this issue the merits of the Hulit device are set forth in an advertisement of Foote, Pierson and Company, of New York, licensees and sole manufacturers of the same. It is possible that Mr. Pierson may be present at the convention as the representative of his firm, influenced by a desire to cultivate a wider personal acquaintance among the railroad telegraph men.

W. R. Brixey, the well-known manufacturer of the famous Kerite wires and cables, because of the necessity of more office room to meet expanding business needs, moved recently into new quarters in the Hudson Terminal Building, 30 Church street, New York. The new Kerite offices are spacious, light and airy, and finely fitted up. The pre-eminence of Kerite products is well known, and they have long since become "standard." This position has been fairly and conscientiously won owing to the wonderful life and durability of Kerite. Kerite wires and cables manufactured half a century ago are to-day in operation, giving perfect results after this long-continued service. Mr. Richard D. Brixey, general manager for W. R. Brixey, will be present at the convention. It will be remembered that Mr. Brixey was last year elected an associate member of the Association of Railway Telegraph Superintendents. Another representative of the firm who will attend is P. W. Miller, formerly and for a number of years connected with the railway department of the American Telephone and Telegraph Company.

The Watson Insulated Wire Company, of Chicago, with offices in the Railway Exchange Building, that city, will be represented at the convention by Mr. J. V. Watson, president. Other officers of the company are, B. L. Winchell, Jr., vice-president, and E. B. Price, secretary and treasurer. This concern has recently been made the western representative of the Kerite wires and cables, manufactured by W. R. Brixey, of New York, the increasing demands for these well-known products making it desirable that sales in the great territory of which Chicago is the center, should be handled by a local concern.

The Chicago and Northwestern Railroad Company is preparing to utilize the telephone in train despatching in place of the telegraph.

The Pennsylvania Railroad School of Telegraphy, established at Bedford, Pa., under the management of J. F. Cessna, September 16, 1907, to train young men in the theory and practice of railway telegraphy and accounts, has turned out sixty graduates. The school is considered one of the most up to date of its kind in the United States being equipped with an electric miniature railroad with ten block and telegraph stations and the workings of the little railroad are most practical. Graduates of this school are provided situations on the system east of Erie.

The board of posts and communications of China has sent in a memorial to the throne relative to the establishment of a postal and telegraph college in Peking, under the instruction of experienced foreign and Chinese teachers, for training young men for service in these two departments.

We desire to state that back numbers of this paper, those issued more than six months prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we sometimes have in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum, or even more. The growing value of complete files of TELEGRAPH AGE should cause our readers to carefully preserve their issues.

The amount of information contained in each issue of TELEGRAPH AGE of the utmost practical value to the progressive operator who is ambitious to succeed, to acquire a more thorough knowledge of his profession, and not only to better qualify himself for the position he now occupies, and consequently for advancement, should prompt many to send in their subscriptions to this journal without delay. The first article in each issue, contributed by Willis H. Jones, under the standing head of "Some Points on Electricity," contains more positive instruction concerning the telegraph, than can be found anywhere else, and is worth more to the operator than many times the cost of the paper itself. Subscriptions should be sent direct to this office, or to any of our agents, who may be found with both the Western Union and Postal companies in nearly every large center in the United States.

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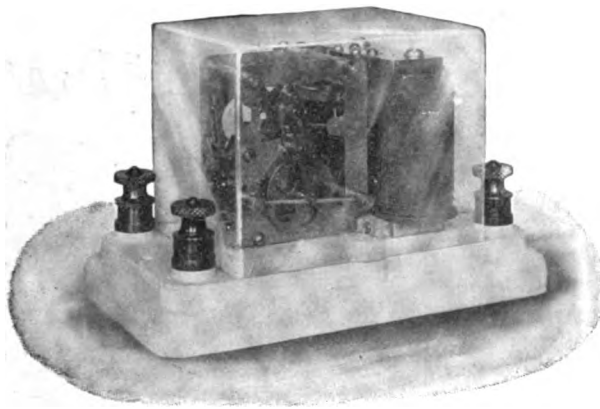
The Gill Selector



THE GILL SELECTOR
SIZE 6 X 3 1-2 X 3 1-2 INCHES

FOR

Train Despatching

The Gill Selectors may be attached to a telephone or telegraph circuit so that the despatcher may call any station or group of stations. A signal is automatically given to the despatcher when the station receives the call.

The operation is extremely rapid, requiring only a few seconds.

The Gill Selector is now used by many of the largest railroads in the United States and Canada and has proved absolutely reliable in actual service.

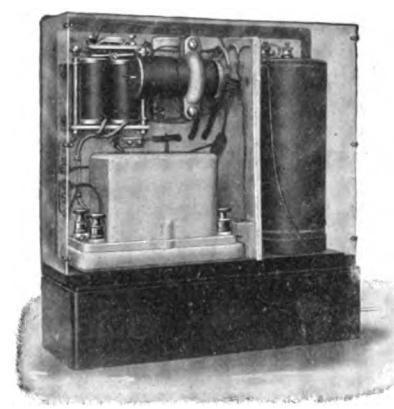
The installation and operation of the selectors does not prevent a high grade of telephonic transmission, nor interfere with regular telegraph service.

They have many advantages which allow them to be used even if the line is in trouble.

The instruments may be rented or purchased at very reasonable prices.

Write us for full information.

AUTOMATIC CALLING DEVICE FOR TRAIN DESPATCHERS' OFFICE
(Cover Removed)
SIZE 22 1-4 X 13 3-8 X 3 INCHES



SELECTOR BOX—OUTFIT COMPLETE
(Cover Removed)
SIZE 11 3-4 X 10 3-4 X 4 1-2 INCHES

United States Electric Company

95 William Street, New York

Sales Agents: WESTERN ELECTRIC CO., New York and Chicago

See Exhibit of these Instruments with that of Western Electric Company at Montreal Convention of Railway Telegraph Superintendents, June 24.

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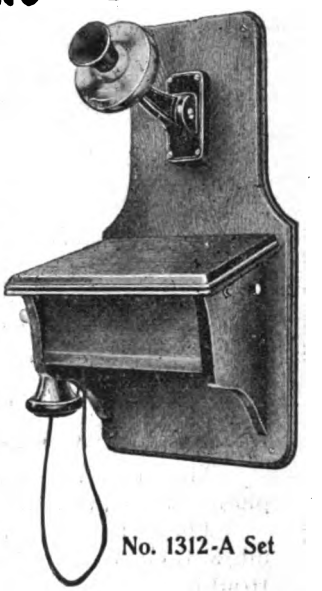
Railway Composite System for Telephoning Over Telegraph Lines

To meet the demand of railway companies for a scheme whereby their existing telegraph lines may be used for telephone service, we have developed a complete line of apparatus.

Different methods are employed according to the service that is required. The railway composite system is very popular where it is desired to secure one telephone circuit for several stations from one grounded telegraph line. With this system the telephone apparatus may be added to the line without changing or rewiring the telegraph instruments. The apparatus is simple and gives splendid transmission.

Western Electric Quantity means Low First Cost

Western Electric Quality means Low Maintenance Cost

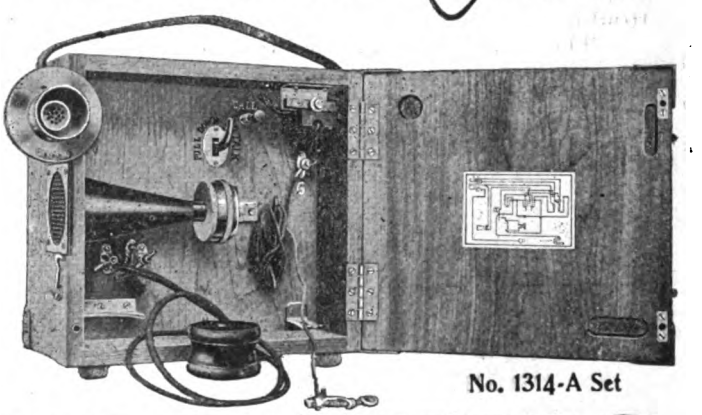


No. 1312-A Set

The No. 1312-A telephone set is for use at a permanent station.

The No. 1314-A telephone set is portable so that it may readily be carried on a train. Connection can be made with a composited telephone and telegraph line by means of the jointed pole and 100-foot cord, shown in the illustration.

Our **Bulletin T-206** gives complete information on the installation and maintenance of these telephones for railway service. This will gladly be sent free upon request.



No. 1314-A Set

WESTERN ELECTRIC COMPANY

EASTERN
New York
Philadelphia
Boston
Pittsburg
Atlanta

CENTRAL
Chicago
Indianapolis
Cincinnati
Saint Paul

Manufacturers and Suppliers of all Apparatus and Equipment used in the Construction, Operation and Maintenance of Telephone Plants

WESTERN
Saint Louis
Kansas City
Denver
Dallas
Salt Lake City
Omaha

PACIFIC
San Francisco
Los Angeles
Seattle

Northern Electric and Manufacturing Co., Ltd., Montreal and Winnipeg
Write our nearest house.

Our Apparatus will be Exhibited at the Montreal Convention of Railway Telegraph Superintendents. June 24-27

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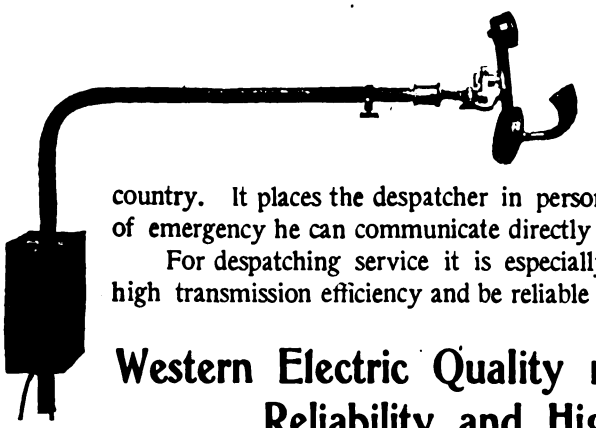
Train Despatching by Telephone Rapid and Accurate

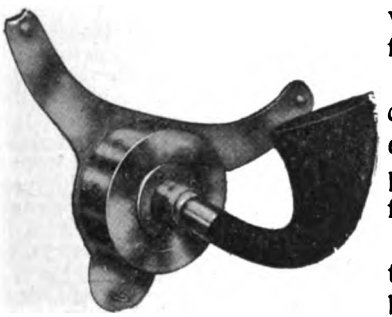


FOR the handling of trains the telephone surpasses all other means of communication. It is no longer an experiment, but is now used by some of the largest railway systems in this country. It places the despatcher in personal touch with the operators at all times. In cases of emergency he can communicate directly with the train crew.

For despatching service it is especially important to select apparatus which will have a high transmission efficiency and be reliable under all conditions.

Western Electric Quality means Reliability and High Efficiency

The Transmitter Arm shown in the upper illustration is designed to meet the requirements of the men at the stations. The transmitter and receiver are adjustable and the arm is so arranged that it does not interfere with the vision and leaves both hands free while taking orders.



No. 234 Transmitter

The No. 234 Chest Transmitter in connection with the No. 128 Receiver is especially adapted for use by the despatcher. It enables him to move about freely while handling his train sheets.

No. 128 Receiver

We have a staff of engineers who are making a special study of telephone service for railway companies and we will gladly give you the benefit of their experience, and advise you of the apparatus best suited for your requirements.

WESTERN ELECTRIC COMPANY

EASTERN
New York
Philadelphia
Boston
Pittsburg
Atlanta

CENTRAL
Chicago
Indianapolis
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Saint Paul

Manufacturers and Suppliers of all Apparatus and Equipment used in the Construction, Operation and Maintenance of Telephone Plants

WESTERN
Saint Louis
Kansas City
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Salt Lake City
Omaha

PACIFIC
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Northern Electric and Manufacturing Co., Ltd., Montreal and Winnipeg
WRITE OUR NEAREST HOUSE

We will Exhibit the Leading Selectors Manufactured for this Work at the Montreal Convention of Railway Telegraph Superintendents. June 24-27

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Train Despatching by Telephone on the New York Central System.

Mr. A. H. Smith, vice-president and general manager of the New York Central and Hudson River Railroad, New York, furnishes details respecting the telephone despatching circuit recently established between Albany and Fonda, N. Y., the Mohawk division of that road, and covering a distance of forty-four miles. Mr. Smith states that thus far the new method of despatching has worked very successfully. The weight of the copper wire used in the telephone circuit is 210 pounds per mile of single wire; 420 pounds per mile per pair; transportations every half mile; number of offices cut in, exclusive of despatcher, seventeen, the selector system for calling offices being used. A description in brief as furnished by Mr. Smith is as follows:

(a) Telegraph selector; offices selected in eight seconds; operated from despatcher's office only, by automatic keys, each combination being made with sending device similar to district messenger call apparatus, consisting of one box containing selector, answer back, battery; shaft of answer back projecting through with button attached to stop gong, operated over telephone line.

(b) To operate the selector over the telephone pair the line is equipped at both ends with a No. 5-N retardation coil of 1,000 ohms across the line; the inside ends of both windings (500 ohms each) connected together to ground at the distant end; at the home end to the automatic sending keyboard which stands open except when the automatic sending key is operated, when battery flows out over the line; at each block station a graphite resistance of 40 ohms is placed in one side of the line, and a 35-ohm relay bridged on to the terminals of the graphite resistance which is operated electrically when current flows out on the line wires, and in turn, operates the selector on a local circuit; the resistance referred to in one side of the line does not impede the voice waves to any extent of the ohmic resistance; the selectors are installed on one wire of the pair at block stations 1, 3, 5, etc., and on the other wire of the pair at block stations 2, 4, 6, etc., to evenly balance the line; selections are made while conversation is carried on, and the current pulsations are not noticeable and there is no interference.

(c) Main test boards at Albany; an eleven-wire test panel was used, similar to those installed at the block stations, four jacks being used for the telephone circuit, wired, to cut off drop or line, or vice versa, to pick up either drop or line with telephone testing set, voltmeter, telegraph instruments, etc.; in the drop end we have installed Argus arresters, type B, also Western Electric protector No. 79-A, the latter being very delicate, to protect the train despatcher's ear from shock and injury; at the test board are installed two complete sets of telegraph instruments consisting of one 150-ohm relay, one 4-ohm sounder and one leg key each; all of the jacks in the switchboard are wired to a terminal distributing frame, bringing out each lug of the jacks to binding posts, at which point the line and drop are connected to spring; sleeve and insulated point bridged to sleeve and insulated point, in each wire; in other words, they are cut-off jacks.

(d) Full description of office equipment at despatcher's office consists of twenty-four automatic sending keys in protected case directly in front of the despatcher; nine Western Electric horizontal keys, four of which are locking and five non-locking; the despatching circuit proper is equipped with only three keys, one locking and ringing key, one non-locking key connected to Western Electric interrupter with which to "howl" receivers; one locking key for transmitter battery; the other keys are used to bridge on two lines or to cut in on separately, made necessary by local conditions and requirements. (The horizontal key installation is more expensive and complicated than actually required; a new layout would be installed with a small monitoring board consisting of as many keys as were necessary to take care of local conditions, the despatcher's set being connected the same as a telephone operator's set is wired to the cord circuit key, one transmitter or battery key and one ringing key.) Despatcher's telephone set consists of one head receiver of 700 ohms resistance, one high resistance transmitter; both attached to a cord and plug (the plug is inserted in jacks No. 108 embedded in the edge of the table); in addition to the selector apparatus for calling, the line key is supplied with generating current with which to ring bridging bells on the line, and in case of failure of said ringing current, a hand generator is provided; the transmitter is supplied by four cells of gravity battery, as the transmitter short-circuits the battery constantly and storage battery was not available; the telephone set induction coils are No. 23 Western Electric and wired—the primary in series with transmitter and battery, the secondary in series with 700-ohm receiver and a 2 m. f. condenser across the line.

(e) Full description of equipment at a way office; one telephone arm with receiver and transmitter mounted upon it in a rigid manner, manufactured for this company on our specifications by the Western Electric Company; one No. 23 induction coil; one 2 m. f. condenser; one 700-ohm receiver; one high resistance transmitter connected up identically as in despatcher's office, except that the transmitter key is non-locking and must be held to contact to close transmitter circuit; two horizontal keys (line key locking and transmitter key non-locking); selector apparatus as previously described; at every third station a bridging bell is strapped across the line for emergency use in case of failure of selectors, i. e., bridging bell at block station 2, another at block station 5, another at block station 9, etc. (the bridging bells so used have proved a valuable asset, not only for emergency calling but they have kept the line balance when it has been open and broken down, making it possible for the despatcher to use the line at various times when so interrupted for five or six hours without recourse to the Morse); at each station an eleven-wire test panel is installed, the line wires being carried in both from the east and from the west, with 210-pound copper insulated wire from office pole to Argus arrester, type A, and from the arresters to the switchboard jack with a No. 12 insulated copper wire; the bridge from the test panel to the telephone set key is run with No. 16 twisted pair and in the bridge is inserted Argus arresters, type B, which have fuses, would not open the line if blown, but simply open the bridging pair; the wiring of the switchboard consists of fifteen No. 108 jacks, five of which are in each line wire and five connected to ground (two jacks east and two jacks west, line; two jacks to pick up the telephone set with line east, two jacks to pick up the telephone set with line west, and two bridging jacks); the telephone bridge is soldered to the bridging jack inside of the test panel; the object of the bridging jack is to provide a means to bridge on any part or all of another circuit.

(f) Strength of current carried on circuit for operating selectors 170 volts (the voltage will be reduced considerably when new type of selector is installed).

(g) Brief description of movements in one operation in which the despatcher and one of the offices is concerned; despatcher calling an office presses automatic selector key down; when gong rings at block station, operator stops gong by turning button back, operates line key to connect set to line, at the same time places ear to receiver and holds transmitter key to contact—total number of movements five, which is accomplished in an indefinite length of time; total time consumed from starting signal until operator is ready to transact business estimated at twelve seconds; to communicate with the despatcher, cuts in his set and speaks—total number of movements as stated, four.

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PRIMARY BATTERIES

Battery Energy: What you get and what you don't get

Battery energy is consumed in two ways:

One way is through the external circuit. The other is by internal resistance.

That which is taken from the external circuit is turned into power for doing the work for which the battery has been purchased.

That which is consumed by internal resistance is wasted. This wasted energy shortens the life of a battery and reduces the voltage below the point of usefulness long before the battery itself is consumed.

The internal resistance of an Edison Primary Battery is but a small fraction of that of other types and decreases with the life of the cell. This means that its voltage is constant regardless of the size of the current that is being drawn from it.

Edison Primary Batteries can be used for all purposes for which electric energy is required. They are alway reliable, very durable in construction and simple to renew and set up. We have informing literature on the subject which we gladly send free on request, giving specific information as to tvpes of cells, number, cost, etc., if desired.

Edison Manufacturing Co., 9 Lakeside Ave., Orange, N. J.

10 Fifth Ave., New York 304 Wabash Ave., Chicago Victoria Rd., Willesden, London, N. W.

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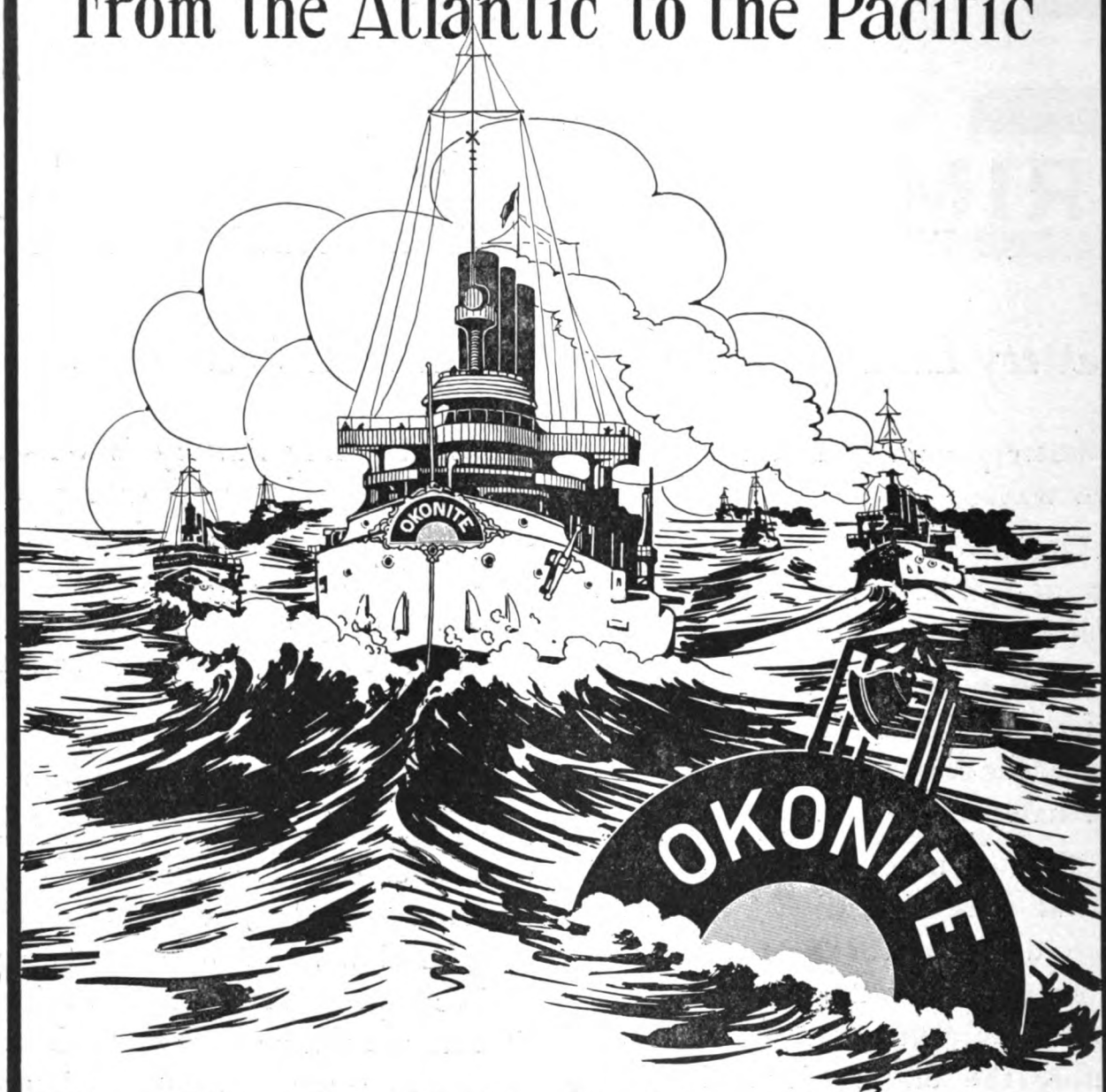
From the Atlantic to the Pacific



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OKONITE keeps you in the channel of success
No grounding No breakdowns

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253 BROADWAY NEW YORK

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Submarine Cables Cut by Trawlers.

So serious has been the damage to transatlantic cables caused by steam fishing trawlers off the western coast of Ireland, recently, that notice has been brought calling attention to the same to the International Telegraph Conference, now in session at Lisbon, by the presentation of a letter signed by all the cable companies. The letter points out that not less than six cables between Europe and North America were interrupted at the same time from this cause, and the delegates were requested to call the attention of their respective governments to the matter with the view of securing measures of protection.

The Commercial Cable Company has also made representations to the State Department at Washington requesting diplomatic correspondence with Great Britain on account of the alleged depredations of these British fishing trawlers, who are stated to have frequently destroyed the company's submarine cables between America and Europe, so continually causing interruptions in cable communication. The company states that during the past three months it has been put to an expense of over $100,000 in repairing cables within fifty miles of the Irish coast on account of the acts of these trawlers, two and even three of the cables having been injured and broken at one time. On May 16 all the broken cables were repaired, but on May 18 two of them were again broken, and on May 19 a third was broken by the trawlers. Other cable companies, including the Direct and the Anglo-American, were also in trouble from the same causes. An official report concerning the situation says:

"The officials of the companies point out that the interruptions affect not only communication between Europe and America, but also between Great Britain and Canada, and consequently between Great Britain and Australia. Great Britain collects a tax on all cable messages passing to or through that country, and it is contended by the companies that no injury to the fisheries would result from excluding the trawlers from the narrow cable zone, but that, on the contrary, such a fish preserve is needed, just as seal preserves are defined and protected. There are thirteen submarine cables in the particular locality off the Irish coast, ten serving America, two serving England, and one serving France. The value of these cables is stated to be $100,000,000.

"On March 14, 1884, a convention was signed by twenty-six States (including Great Britain and the United States) by virtue of Article II., of which it was agreed to make the wilful disturbing or injuring of a submarine cable a criminal offence. This article reads as follows:

It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, so as to interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for damages. This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their lives or their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable.

"The United States enacted such a criminal statute in 1888. While the difficulty in enforcing such a statute is recognized, owing to the fact that the offence is committed on the open seas, where there are no police, the Commercial company maintains that Great Britain is obliged by international law to prevent its citizens destroying the property of American citizens, even on the high seas. A precedent for exercising such authority is found in the Act of Congress and Proclamation of a President of the United States, which in 1896 prohibited American citizens from killing seals in the Pacific Ocean north of the thirty-fifth degree of latitude."

The shore ends of the cables will stand a strain of fifteen tons before breaking, thus showing the power of the dredging machine operated by the trawlers, for fishing purposes, their clutch on the cables reducing the strands to a mere pulp.

Code Words at the Lisbon Conference.

The cable and telegraph administrations of the world, according to a London authority, have found from experience that the extra facilities offered to the mercantile public in the unrestricted use of code vocabularies has been abused by the use of words which do not come within a reasonable interpretation of the clause agreed to by the International Telegraph Conference held in London in 1903. The object of the concession to the coding public made by the delegates at the London Conference was to facilitate the general use of code words, and it is well known to those who have full acquaintance with the working of telegraphic systems that neither in submarine cable nor land line working has any obstacle ever been put in the way of the use of code words which the telegraph operator may reasonably be expected to comprehend. It would appear that the telegraphic administrations are only making reasonable protest in calling attention to the abuse of the facilities so readily offered, and in asking the delegates at the Lisbon conference to put this matter on a more equitable basis. This is made evident by the remarks of the chairman of the Eastern Extension Australasia and China Telegraph Company at the annual meeting of the company recently held in London. He said: "It is not proposed to withdraw the privilege, but only to endeavor to have more clearly defined the condition as to the 'pronounceability' of artificial words. When the concession of admitting any pronounceable artificial words on the footing of code at ten letters to the word was granted, it was assumed that the privilege of making up codes on this basis would be used in a reasonable manner, so that the telegraph service, whether by cable or landline, might not unduly suffer, while the public would be benefitted. This expectation has not been completely fulfilled. Before the new regulations came into force the British Post Office found it necessary to issue a circular to the

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Chambers of Commerce, as well as to the principal code makers of England, directing attention to the fact that codes were being compiled of artificial groups of letters which in many cases could not be regarded as 'pronounceable,' and that such words would be difficult to transmit and would lead to errors. In many cases code makers have recognized the importance of avoiding combinations which are of doubtful pronounceability, but in some cases an unreasonable use of the concession has been made. As an instance of this, such words as 'bujksrocty,' 'bywrgrocbx' and 'liqraqkper' may be mentioned as words which appeared in a code recently submitted. It will be readily understood that a telegrapher can deal more rapidly and easily with a pronounceable word, which can be more quickly grasped and remembered while it is being transmitted, as compared with an arbitrary combination of letters requiring a separate effort of attention for each letter. Thus greater speed and accuracy, which are what the public require, are obtained, and there is less need for repetitions and corrections. It is desirable and to be hoped that the condition as to the pronounceability will at the Conference be more clearly defined, in order to put some limit for the future to this tendency, which, if unchecked, cannot fail to produce results highly injurious to the telegraph service and, consequently, to the public and commerce. There is, however, no intention of adopting other than a wide and even generous interpretation which would cover the great bulk of the codes at present in use."

The Creed Receiving Telegraph Perforator.

Mr. Frederick G. Creed, telegrapher and inventor, a native of Nova Scotia, but who during the past few years has lived at Glasgow, Scotland, where he is engaged in the development of telegraph inventions, has been granted, as noted in the June 1 issue, a United States patent for improved telegraphic apparatus. More specifically, it is for a receiving telegraph tape perforator. This patent, which is numbered 887,313, is for improvements on the original invention, described and illustrated by a line drawing in Telegraph Age, July 1, 1907.

This invention has reference to that kind of apparatus for perforating a tape in accordance with electric currents or impulses received over a line wire in the manner usual in automatic Wheatstone telegraphic receiving apparatus, wherein the punch or punches used for perforating the tape are operated by a fluid pressure motor controlled through electro-magnetic mechanism that receives the electrical currents or impulses, and the correct position of the tape, previous to its being punched, is insured by correcting means that are caused to act upon a yielding feed wheel and adjust the same in a rotary direction relatively to the constantly running driving shaft used to feed the tape through the apparatus, the successive operations of correcting, punching and releasing the tape being performed so quickly that the time during which the rotation of the feed wheel is stopped, is practically negligible.

Now the present invention has for its object to further improve the construction and working of telegraphic apparatus of the kind referred to for producing practically perfect perforated Wheatstone tape from electric currents, impulses or signals received from a distant station. To this end in apparatus according thereto and in order to enable a high speed of working to be attained, the valve of the fluid pressure motor used for actuating the tape-punching mechanism and tape-correcting mechanism is actuated from the armature of an electro-magnetic device that is arranged to be placed in a local circuit and is caused to operate the armature alternately in opposite directions by currents from a separate electric generator that is under the control of a relay in the line wire over which the electric currents to be reproduced as perforations in a tape are sent, the local circuit of the said electro-magnetic device that is under the control of the said armature, the arrangement being such that the currents passing through the electro-magnetic device are reduced to or cut off at unit length, no matter in what order or manner they arrive through the line relay.

Obituary.

Francis Hughes Webb, from 1878 to 1898, secretary of the Institution of Electrical Engineers, of England, died at London, May 21, aged eighty-four years. He was a man of ripened experience in telegraph, railway and engineering matters.

Sir Robert Gillespie Reid, a wealthy railroad contractor, who had much to do with the development of Newfoundland, and who until recently had the monopoly of telegraphs in that island, died at Montreal, June 3, aged sixty-six years. He was a native of Scotland.

William Arnold Anthony, professor emeritus of physics and electrical engineering in Cooper Institute, New York, died, May 29, of heart disease, at the age of seventy-three years. Professor Anthony was born in Coventry, R. I., and was graduated from Yale. In 1895 he became professor of physics and electrical engineering at Cooper Union, and three months ago was retired from the faculty and made professor emeritus. Professor Anthony was a member of the American Institute of Electrical Engineers, the Franklin Institute of Philadelphia, and the American Social Science Association. He was president of the American Institute of Electrical Engineers in 1890-1. He was practically the first American professor of electrical engineering, his work in this direction when a professor at Cornell being altogether of a pioneer character, and having a marked influence on the trend of electrical study in this country.

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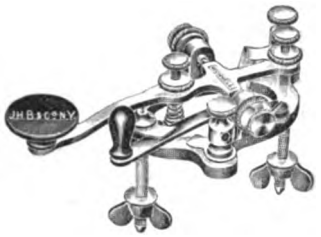

Bunnell's Latest Specialties

FRY SPECIAL KEY

For Open Circuit, Dry Battery, Telegraph System

This key was specially devised for the purpose by Mr. U. J. Fry. Operators do not have to learn anything new in using it. The movement of throwing open the circuit-closer of the ordinary key is repeated in the Fry type and this movement puts the battery in position to transmit signals. The reverse movement, or closing of the circuit-closer, opens the home battery, but leaves the relay in position to receive signals. A further advantage of the Fry open-circuit key is that when the circuit-closer switch is in closed position the battery circuit cannot be closed by pressing down the key lever, hence there is no danger of wasting the battery by a book or other heavy article resting on the key knob.

The Best Dry Cell

The Dry Battery to use is our "Jove," also known as "BUNNELL'S BEST." It is specially made for ignition work, but is the **best dry cell** that has ever been produced for all work and is **particularly adapted for open circuit telegraph systems.**

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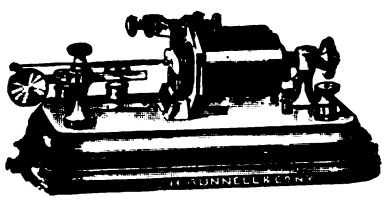

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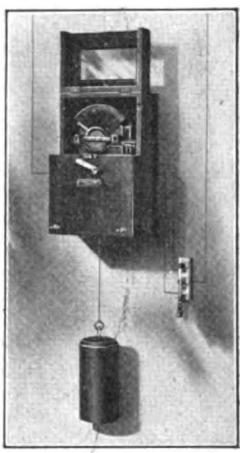

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The Electron Theory.

BY EDWARD J. PARTRIDGE.

(In the Journal of the Franklin Institute.)

[Concluded from June 1.]

The electron theory of metallic conduction yields a most satisfactory explanation of the Hall effect and the associated phenomena discovered by Nernst Ettingshausen and Laduc. The Hall effect, discovered at Johns Hopkins in 1878, is the lateral deviation of an electric current that is flowing through a magnetic field. The effect is observed by passing a current through a thin rectangular plate of metal that is between the poles of a powerful magnet. If connection be made to the sides of the plate and the magnet excited, a lateral current is observed. If an electric current were maintained by equal progression of positive and negative units in opposite directions there would be no Hall effect. For opposite charges moving in opposite directions would be deflected to the same side of the plate. The existence of the Hall effect demonstrates that an electric current consists of a flow that is greater in one direction than the other. The direction of the Hall effect shows that it is the negative electrons that are principally concerned in the phenomena of electric currents. In addition to the Hall effect there are a number of concomitant effects that have been discovered later, there is a difference of temperature developed between the edges and also a longitudinal difference of temperature and difference of potential. There are four entirely analogous phenomena to be observed if a current of heat is passed through the plate that is in a magnetic field. Zahn, in 1904, made an elaborate study of this field and examined his experimental results in the light of Drude's theory. His conclusion was that the theory was well substantiated if the minuteness of the quantities and the experimental difficulties were taken into consideration.

The ratio $\frac{e}{m}$ for an electron has been determined by several distinct methods with practically identical results. Because of the invariability of the properties of kathode rays when the residual gas in a vacuum tube is changed the question arose, "Is the 'm' involved in this ratio, matter in the ordinary sense?" A negative answer to this question has been rendered possible by the following course of reasoning: A charge of electricity possesses inertia. To be explicit; a sphere of metal charged with electricity requires a greater force to produce a given acceleration in it when the sphere is charged than when it is not. This fact was established in a mathematical paper by J. J. Thomson in 1881. A moving charge is an electric current. An electric current is associated with a magnetic field, which possesses a definite amount of energy. A change in the velocity of the charge means a change in the intensity of the magnetic field, that is, a change in the amount of energy stored in the field. To add energy to the field requires work to be done; a force to act through a distance.

We have long been familiar with the idea of self-induction and have illustrated the idea by saying that an electric current acts as if it possessed inertia. In future we shall say, "an electric current possesses inertia." Indeed the idea is fast gaining ground that what was called the quasi-inertia of an electric charge is the only inertia with which we have to deal. The inertia of a charge at rest is $\frac{2U E^2}{3A}$, according to the calculation of Thomson.

In this formula U is the magnetic permeability of the medium, E is the charge, and A is the radius of the sphere. Since the radius appears in the denominator, the less the radius, the greater the inertia. Consequently, any charge, however small, may have any inertia, however great, if we make the radius sufficiently small.

In this connection an additional truth developed by Heaviside and J. J. Thomson is of paramount importance. These men have shown mathematically that the inertia of a charge is not a constant quantity but a variable, that increases with the velocity of the charge. The truth of this statement can be seen almost intuitively, if we remember that an electromagnetic disturbance is propagated with the velocity of light and that therefore the lines of force of a moving charge are not radial as they are when the charge is at rest, but are bent backward approaching the equatorial plane. As a line of force in Maxwell's theory is a line of electric displacement and a varying displacement is an electric current the motion of a line of force in the direction of its length will not produce a magnetic field as there is no current, there being no varying displacement. The greater the angle up to 90° between the direction of the lines of force and the direction of motion, the greater the magnetic field that is produced. Therefore a variation of velocity when the lines of force are bent backward so as to approach the equator of the moving spherical charge will cause a greater expenditure of energy; the exertion of a greater force, which is the same as overcoming a greater inertia.

The formula expressing the dependence of inertia upon velocity shows that the change in inertia is slight until velocities approaching that of light are reached. In the neighborhood of the velocity of light the increase in inertia is very rapid, so that inertia asymptotically approaches infinity with increasing velocity, reaching infinity at the actual light velocity. This deduction from theory has been subjected to experimental test by several experimenters. The first work in this line was with kathode rays, but the velocities are not sufficient to cause changes of inertia much beyond the limits of experimental error. Stark has, however, demonstrated a slight increase of inertia in extremely rapid kathode rays.

The crowning work in this field has been done by Kaufmann, of Göttingen, who has determined

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the ratio $\frac{e}{m}$ for the β rays of radium by simultaneously observing the deflection produced by electric and magnetic fields of known strength. Rays from a small quantity of radium salt were permitted to pass through a small hole in a piece of lead and then to pass through the electric and magnetic fields maintained in the same space, and finally to fall upon a photographic plate. The difficulty of the experiment can be appreciated by noting that the exposures were of two or three days' duration, and that the electric and magnetic fields had, of course, to be maintained constant during the entire time. Owing to the fact that β rays from radium are not homogeneous, but have very different velocities, the electric and magnetic fields spread them out into a kind of spectrum, each point of which corresponds to a particular velocity. The measurement of the deviations permits the determination of both "m" and the velocity. Kaufmann has demonstrated not only that the mass increases with increasing velocity, but also that the entire mass is due to the charge of electricity that constitutes the particle. From Kaufmann's measurements a judgment is possible concerning the relative probability of the various theories that have been advanced concerning the constitution of the electron. That is, as to whether an electron is a rigid sphere of negative electricity or a sphere that is deformable with change of volume or deformable without change of volume. The conclusion which Kaufmann reached in 1906 was that the rigid electron or the electron that is deformable without change of volume equally satisfy his measurement. To distinguish between them would require a greater accuracy than has hitherto been attained. The whole question as to the possibility of an electron whose shape is not constant arose from the failure to observe any optical phenomenon that is dependent upon the motion of the earth through the ether, provided the source of light is terrestrial. Lorentz has shown that if a contraction takes place in the direction of motion and no change at right angles thereto, that no effect can be perceived by an observer moving with the apparatus. This whole question bristles with difficulties and is still under discussion. This much is certain, the inertia of an election is all electrical inertia.

Combining this fact with the knowledge derived from the study of the Zeeman effect, that there are electrons in the atoms of matter, we have strongly suggested that all inertia is electrical. In other words, that atoms are aggregates of electrons.

J. J. Thomson has elaborately worked out the conditions of stability of groups of electrons supposed to be held together by the attraction of an atomic nucleus of positive electricity. He supposes the electrons in an atom to be arranged in rings and to be rotating around a center. He finds that if the number of electrons be increased that the number in a ring may increase to maximum, but that any further increase in the number of electrons will cause the formation of more rings. He shows that atoms built up of electrons whose numbers vary from 59 to 67 show a progressive change in properties, recalling the progressive change in a line of the periodic system of the elements.

The work of J. J. Thomson is the most ambitious attempt to explain the periodic system. Thus far it is merely an analogy.

Our knowledge of the structure of the atom is at the present time almost limited to the results of Stark and his school on the canal rays. Canal rays are observed in the space back of the perforated kathode rays. They are particles that carry a positive charge of electricity. They have masses of atomic magnitude and so are sharply differentiated from kathode rays, whose particles have masses but 1/1000 that of the hydrogen atom. Canal rays have been observed in many gases. And also the lines in the spectra show the Doppler effect, that is, are displaced in consequence of the motion of the centers of the emission of the light. The Doppler effect in the spectra of canal rays has been observed in the lines of mercury, nitrogen, carbon, oxygen, helium, argon, potassium, sodium, and lithium.

It appears from Stark's work that an atom-residue, positively charged, after having lost a single electron yields a spectrum consisting of series of doublets. If the atom has lost two electrons it emits light, the spectrum of which contains series of triplets. The band spectrum appears to be radiated from the complete atom that is electrically neutral.

From what has been thus far said it would appear that the electron theory has been elaborated to explain certain results of modern experimental physics. The idea has, however, been reached through another channel. Plank by applying general reasoning of the style adopted in thermodynamics and energetics in general to the theory of radiation has reduced the mass of the hydrogen atom and also the charge that he denominates the elementary quantity of electricity. This determination of Plank of the mass of a hydrogen atom, and the charge constituting an electron, is, to my mind, one of the most remarkable intellectual results ever achieved. Drude speaks of them as being probably the most accurate values of these constants that we possess.

The fact that no optical phenomenon depending on the motion of the earth through the ether has even been observed, provided the source of light is terrestrial has lead Einstein to formulate what he calls the principle of relativity. This principle assumes that no such phenomenon is possible. Plank and Stark combined in this principle with the principle of least action and deduced the most remarkable fact that the mass of a body at rest is equal to its internal energy divided by the square of the velocity of light. The smallest inertia with which we are acquainted is that of a single electron. This inertia multiplied by the square of the velocity of light gives us the value of the elementary quantity of energy.

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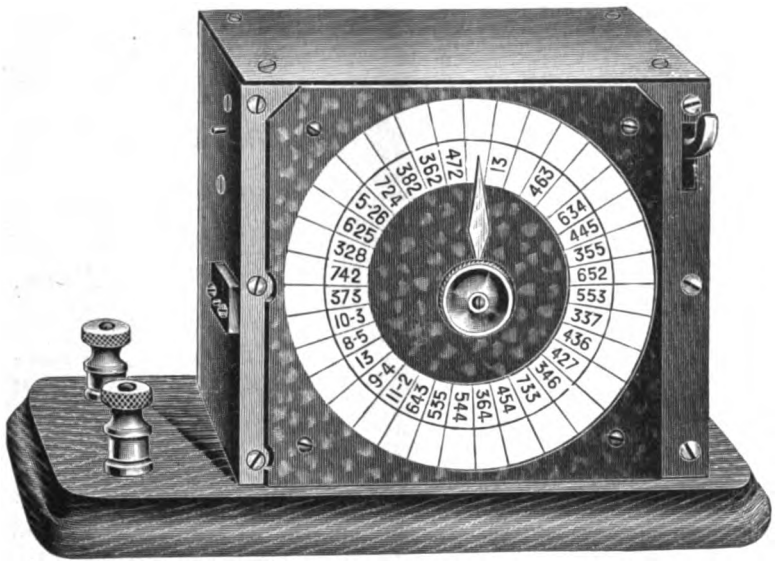

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Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Montreal, Que., June 24, 25, 26 and 27, 1908.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich., August 19, 20, 21.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers' Association meets at Fort Worth, Tex., on June 18, 1908.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

The influx of new men in the telegraph service has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is $1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

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Letters From Our Agents.

KANSAS CITY, POSTAL.

Harry Morlan, for some fifteen years manager of the Postal company's Board of Trade office in this city, and for the last two years manager of the main office, recently resigned and went to Dallas, Tex., where he is identified with the Metropolitan Book Company, a concern in which he is substantially interested. No man engaged in the telegraph business in Kansas City and vicinity was more popular than Mr. Morlan with the business public or with employes. When he was promoted to the main office from the Board of Trade the grain men presented him with a handsome gift in appeciation of his long and satisfactory service in handling their business. When Mr. Morlan retired the employes of the main office joined in tendering him a handsome gold watch, Superintendent A. B. Richards making the presentation. Mr. Morlan carried with him into his new field of endeavor the best wishes of all telegraph people in Kansas City.

NEW YORK, WESTERN UNION.

The operators of the commercial news department celebrated their first general outing in recent years at "The Cove," West Brighton, Staten Island, on May 31. The gentlemen made it an occasion for family enjoyment, and the ladies who accompanied the party divided the field honors with their escorts by contesting in numerous games for which appropriate prizes were awarded. A baseball game between the married and single men resulted in a hard-earned victory for the single team, score, 9 to 7. Tables were set for sixty-five in the ballroom of the hotel, and after the meal there were speeches, vocal and instrumental music and some entertainment by Mr. A. G. Waring, magician, who is also a member of the force. Mr. H. M. Heffner, chief operator of the commercial news department, acted as toastmaster at the dinner.

The many friends of Mr. J. R. Heidemark, assistant southern wire chief, were shocked and grieved to learn of the sudden death of his wife, which occurred May 26.

Mrs. J. F. Zeiss, nee Anna Schaefer, a former operator in this office, wife of the chief operator of the Postal Telegraph-Cable Company, this city, died at her residence in Bloomfield, N. J., May 12.

James Lowen Young, of Superintendent Skelton's staff, and Miss Josephine Veronica Hopkins, of the main office operating department, were married in Brooklyn, June 7. The wedding trip took the couple to the Catskill mountains.

Morse Electric Club Outing.

The outing of the Morse Electric Club will be held at Cove Hotel, New Brighton, Staten Island, July 18. Colonel R. C. Clowry, president of the Western Union Telegraph Company, has kindly placed the cable tug "Western Union" at the disposal of the club to convey the members to and from the grounds. Athletic games and a game of baseball will be indulged in. An enjoyable time is expected. The entertainment committee are arranging for the comfort and enjoyment of the members. J. B. Van Every is the president of the club, and R. J. Murphy, secretary.

The Old Time and Military Telegraphers' Reunion.

The annual reunion of the Old Time Telegraphers' and Historical Association and the Society of the United States Military Telegraph Corps, will meet this year at Niagara Falls, N. Y., on September 16, 17 and 18. This in reality will be the holding of the postponed meeting of 1907, deferred at that time because of the disturbed conditions in telegraph circles. Practically the same programme of entertainment determined upon last year, will be carried out this year, and headquarters will be established at the International-Cataract Hotel, as before designated.

The officers of the Old Time Telegraphers' and Historical Association are: Harvey D. Reynolds, president, Buffalo, N. Y.; George A. Burnett, Buffalo, N. Y., I. McMichael, Toronto, Ont., and George F. Macdonald, Ottawa, Ont., vice-presidents; John Brant, secretary-treasurer, 195 Broadway, New York.

The officers of the Society of the United States Military Telegraph Corps are: Colonel William B. Wilson, Holmesburg, Philadelphia, president; William L. Ives, New York, vice-president; D. H. Bates, 658 Broadway, New York, secretary and treasurer. The latter has sent out the following circular letter, addressed to comrades in that organization:

"Colonel William B. Wilson, our president, believing that our reunion at Niagara Falls this year should be a large and impressive one, will, with the assistance of the executive committee, use every effort to bring about that result. In view of this he has appointed the following committee to act in conjunction with the president and committee of arrangements of the 'Old Time Telegraphers' and Historical Association,' whose headquarters are at Buffalo, N. Y.:

"George A. Burnett, chairman; Joseph Anderson, Madison Buell, and Thomas A. Laird, Buffalo, N. Y.; James K. Parsons and Harry L. Gregg, Rochester, N. Y.; Joseph Schnell, Binghamton, N. Y.; George J. Goalding, Erie, Pa., and I. McMichael, Toronto, Ont.

"It is desirable that your committee see that proper arrangements are made to the end that the dignity and importance of the historic services of yourself and comrades are fittingly recognized."

The People's Mutual Telegraph Company has been incorporated in Chicago, with a capital of $25,000; the purposes as stated in its papers, being to conduct a general telegraph business. The names of the incorporators as given are W. F. Sommers, Michael Feinberg and Solomon Salins.

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Chicago Western Union Notes.

Officials are very busily engaged these days in preparing for the national Republican convention, to be held on June 16. Both telegraph companies will have well equipped offices in the convention hall, The Associated Press and The United Press offices being located between those of the two commercial companies.

Advance information indicates that a large number of press representatives will be here and the boys are hoping that the file of press matter will insure them a few hours' extra time.

New apparatus for the Barclay printing department is being received at frequent intervals and we anticipate that the system will soon reach all heavy trunk line points. In fact, they are nearly all reached by that system now.

Many operators in Chicago are still seeking employment, both companies have engaged quite a number of men in anticipation of the heavy work during convention week.

It is expected that quite a number of the most expert men will be given an opportunity to go to Denver during the Democratic convention, which will no doubt make a pleasant outing for them.

Quite a number of the younger men in the office are evincing an interest in electrical and mechanical lines. Some of them are studying to become wire chiefs or repeater chiefs, others are familiarizing themselves with duplexes and quads, and others still are taking up the study of the printer apparatus, hoping thereby to fit themselves for promotion in the future.

G. F. Bassett, chief clerk of the operating room, has returned from a pleasant two weeks spent in Denver. During Mr. Bassett's absence W. H. Marshall filled the position as chief clerk and has been kept busy by Chief Operator Cowan almost continuously since Mr. Bassett's return, working on convention matters.

Mrs. Pollock, who had the misfortune to fall and break a limb during the icy period of the early spring, has recovered sufficiently to again resume her duties, although she is compelled to use crutches.

We understand about fifty men have been given signs by Chief Operator Cowan since June 1, and many more are anxiously awaiting the time when they will be made happy.

The following well-known telegraphers were recently assigned to duty at La Porte, Ind., to handle press matter during the Gunness investigation: C. H. Bowles, M. J. Duggan, W. H. Meacham, F. C. McLean, Chas. R. Sims, B. L. Wilson and J. C. Salak.

Mrs. Langdon Smith, the widow of Langdon Smith, a former well-known telegrapher and newspaper writer, lately deceased, committed suicide, in Brooklyn, on June 10, the action being due to grief over the death of her husband which caused insanity to develop.

A practical illustration of a "bug" on the wire was afforded recently on a Western newspaper circuit. There was an interruption, and the wire chief was summoned to investigate the cause of the trouble. Hastening to the desk on which the instruments are placed the chief discovered a large water bug perched on the connecting points of a pole changer, effectually closing communication on that circuit. The stranger had paid for its curiosity, for 385 volts of electric current had passed through the beetle, which had died before enjoying the sensation of holding up an important news story. An old telegraph operator standing by said it was the first time he had seen the real thing in his thirty years' experience.

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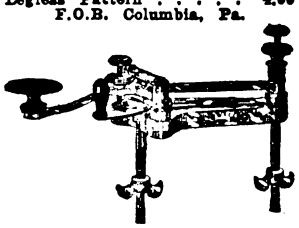

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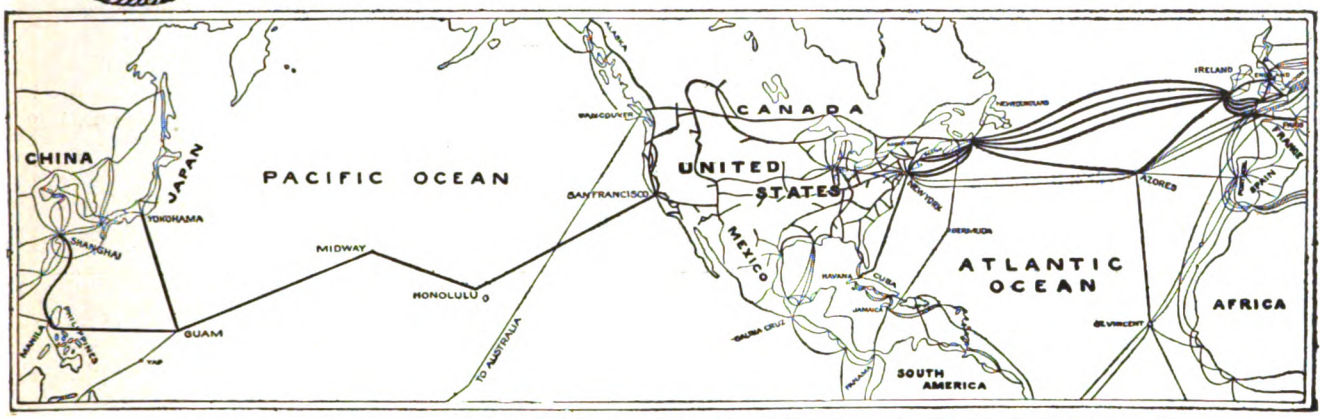

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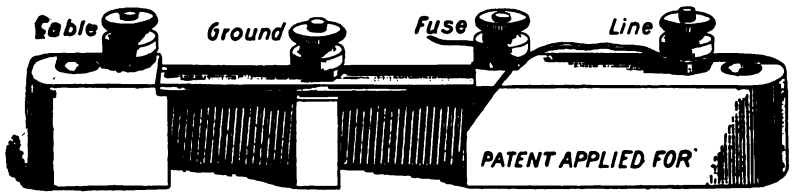

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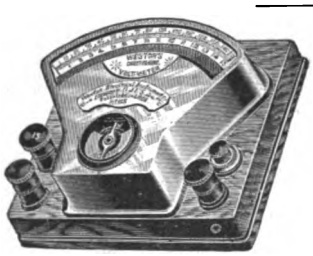

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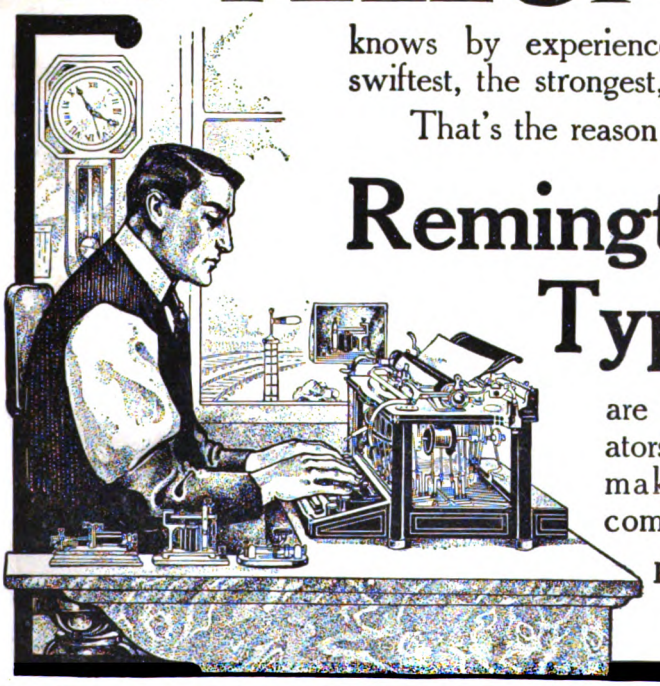

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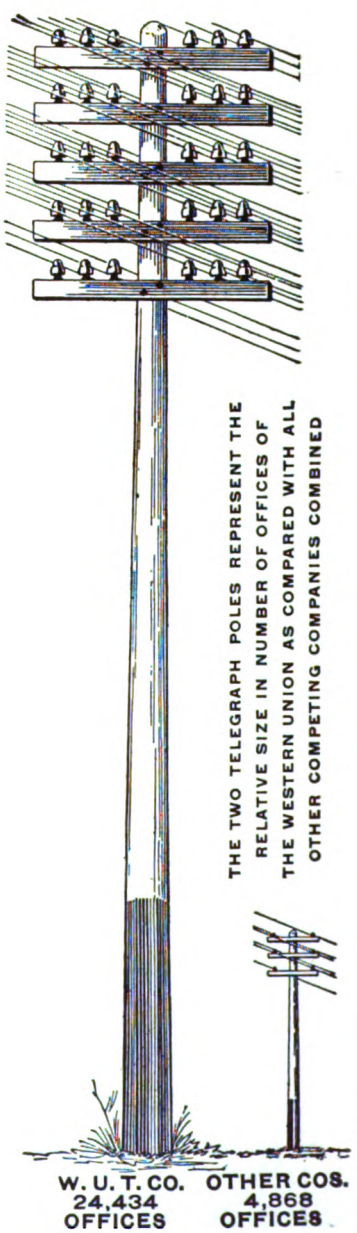

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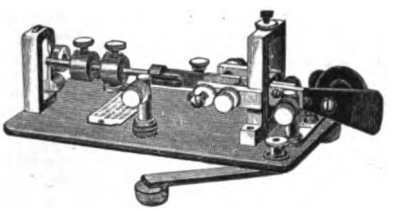

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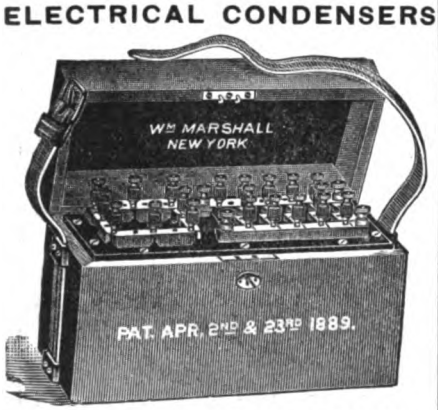

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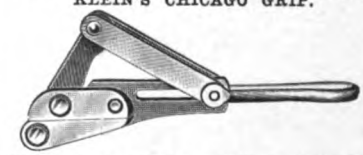

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SOME POINTS ON ELECTRICITY.

A Few Simple But Important Rules Which Should Always Be Followed.

BY WILLIS H. JONES.

It is a well-recognized fact that some people, no matter how hard they may try, never seem able to make a neat job of anything in the way of mechanics they attempt notwithstanding the fact that often such persons possess intelligence and ability of the highest order in other directions.

Of course such inability on their part is due to lack of what is called natural mechanical ingenuity. Nevertheless one is hardly excusable even on that ground who does not acquaint himself, at least, with the basic rules which govern the practical handling and installation of the apparatus used in his chosen profession.

BINDING POST CONNECTIONS.

For the first illustration let us take the simple operation of connecting the wires with the binding posts of an ordinary relay or sounder. Surely no task could appear simpler, yet how readily we can distinguish by the "finish" the work of the novice from that of the experienced.

Now, while neatness is of course greatly to be desired, a good "finish" is not, after all, the only consideration. The principal aim, and most important factor, is to make the connections in such a manner as to give the greatest possible area of contact between the wire and the binding post thumbscrew and thus indirectly insure a splice which is not likely to work loose.

One of the mistakes a novice usually makes in attempting to restore a broken connection of this kind is that he brings the hook end of the wire around the post too far, as shown at A in Fig. 1, with the result that when the thumbscrew is depressed the only contact that is made between the wire and post is at the single point where the wire laps over itself and thus presents a double thickness. The depressing screw, therefore, can have but little purchase on a wire looped in this manner, and the result is that after the relay or sounder has experienced a few knocks or jars such as they are subjected to during the process of readjustment, or otherwise, the improper connection becomes either loose or broken altogether. The hook should be so bent that it will

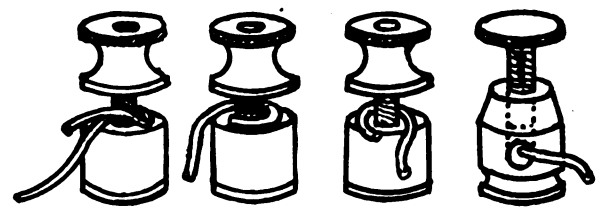

FIGURE 1.

just encircle the binding post, but not lap over. When this is the case, as shown in example B, the thumbscrew when depressed will make firm contact with the wire all around the circle and hold it fast.

The companion mistake to the one just described is that of not only failing to make the loop sufficiently round, but placing the hook terminal on that side of the post which is against the direction of the twist of the thumbscrew when the latter is being depressed against the wire, as shown at C. While this may seem like a trifling matter the defect in such a connection will be apparent to anyone who will stop to consider the fact that with a right-hand twist movement of the thumbscrew and a left-hand formation of the hook the tendency is to push the wire out instead of in, as would not be the case if we reverse the position and place the short end of the hook on the right-hand side of the post as we face the latter. It should be quite evident that the proper way is to always bend the loop or hook in the direction the holding screw takes in

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the operation of being lowered in order to make contact. When this rule is followed the hook will tend to close and hug the binding post instead of opening and struggling to get away from it.

When one is so unfortunate as to be compelled to use the outlandish pattern of binding posts with holes in them for the insertion of the wire, as shown at D, he is simply doomed to take a chance on a permanent connection or use eternal vigilance in order to feel safe. About the only advice we can give is that the screw must not be depressed so hard that it cuts the soft copper wire and thus creates a tendency to be easily broken or given such an angle that will subject it to frequent twists when the cord is moved. Binding posts of this type should be inspected at short intervals instead of waiting for a complete breakdown, as there is nothing so exasperating as those little infant troubles which are not sufficiently developed to find or even suspect except by those who have had long experience as a "trouble hunter."

SWITCH LEVER DEFECTS.

Whenever a chief operator allows a steel pen to be inserted between a switch lever and the disk it should normally rest on, for the purpose of closing the local circuit, except possibly in a case of great emergency, it is safe to conclude that he is either lacking in mechanical ability or not impressed properly with the highly dangerous nature of such a connection. In either case it is a question as to whether the defective switch or the indifferent chief will eventually do the most harm to the service.

When a switch becomes in such a condition that it requires auxiliary help to maintain contact, the lever should at once be removed and bent properly by means of a pair of pliers. There is no use in attempting to give the metal a downward inclination by hammering it while still in position, as the disk will not permit a further depression. The proper way is to remove it and then shape it as required, after which it will be as good as new when replaced.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 889,592, for a telegraph system, has been granted to Stephen D. Field, of Stockbridge, Mass. A local inductive shunt at each station is bridged directly across the key thereat, but does not include the local relay. There is a short-circuiting shunt for bridging the key and the inductive shunt when desired.

A patent, No. 889,784, for a telegraph system, has been issued to Charles K. Jones, of Quincy, Ill. The armature of a relay is arranged to close the circuit of an electromagnet. The armature is supported on a rotable disk.

A patent, No. 889,787, for a means for producing telegraphic transmitting tapes, has been awarded to Isidor Kitsee, of Philadelphia, Pa. Three keys are provided in this device, two for punching holes in the tape and for moving it definite distances and the third key for determining which of the other keys shall operate.

A patent, No. 889,788, for electric transmission of intelligence, has been taken out by Isidor Kitsee, of Philadelphia, Pa. A telegraph line has the two line wires twisted together so as to be conductively independent but inductively related to each other.

A patent, No. 890,042, for an automatic telegraphic transmission instrument, has been secured by John Gell, of London, England. Automatic telegraph transmitter of the type adapted to send dots or dashes continuously by alternate movements of the operating key. Relates to details of the T-shaped operating lever, having specially constructed contacts.

The following patent has expired:

Patent No. 454,338, for an electric telegraphic apparatus, held by S. V. B. Essick, of Brooklyn, N. Y.

Personal.

Mr. Melville E. Stone, general manager of The Associated Press, supervised the work of that organization at the Republican National Convention at Chicago.

Mr. T. J. Cooper, manager of the Bay City, Mich., office of the Western Union Telegraph Company, has returned from a European trip after an absence of eleven weeks.

Mr. Edward H. Johnson, a well-known old-time telegrapher and a former president of the Magnetic Club, New York, who has been abroad on business for ten years past, has returned to this country.

Mr. Harry O. Rugh, of Sandwich, Ill., engineer of the Sandwich Electric Company of that place, was a recent New York visitor, stopping over on his way to Montreal, whither he went to attend the convention of the railway telegraph superintendents.

Mr. James H. Drakeford, well known in the telegraph profession, formerly manager of the Cotton Exchange office in New York for the Western Union Telegraph Company and at one time manager at Asheville, N. C., is now engaged in the practice of his profession as an optician in New York.

Major J. Orton Kerbey, of Washington, the old-time telegrapher, sailed for Brazil on June 20, going thither in the interest of the Pan-American Bureau, in whose employ he is. The major expects to make a trip of one thousand miles up the Amazon river and also to journey up the Madeira river. This is a country with which he is familiar, having formerly visited the same. At one time Major Kerbey was United States consul at Para, Brazil.

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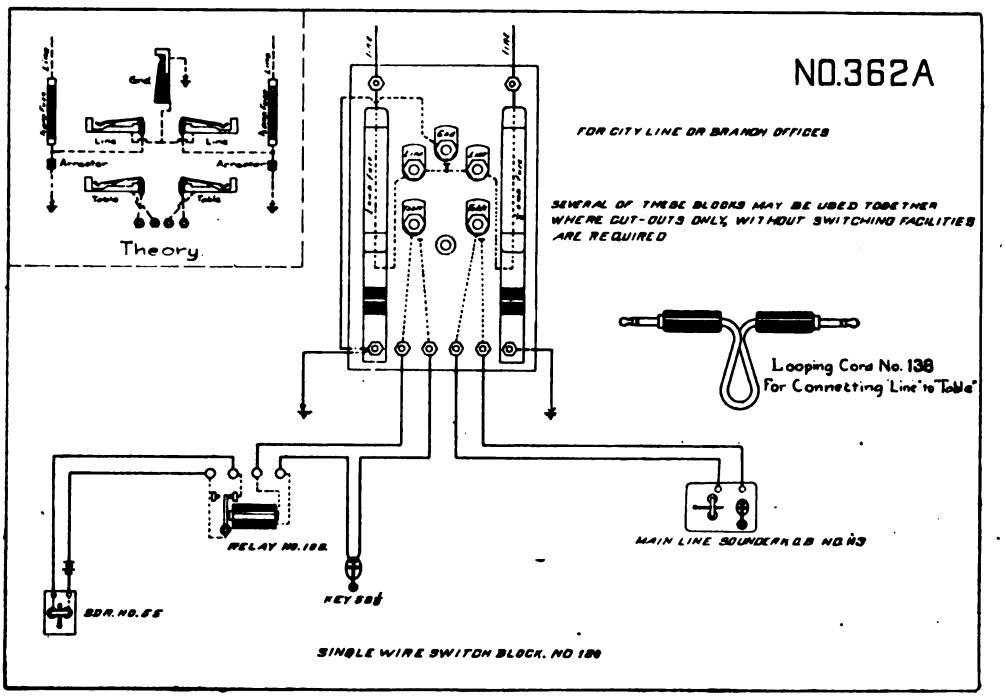
Postal Telegraphic Apparatus.

[Under this head there will appear in each issue of Telegraph Age an illustration and descriptive account of some feature of the equipment of the Postal Telegraph-Cable Company, prepared by John F. Skirrow, associate electrical engineer of the company.]

The switchboard block shown in the accompanying cut is intended for use in small offices, such as hotel and city branch offices, where facilities for cross-connecting wires are not required.

Provision is made to operate one or two instruments upon a loop and to split the loop by grounding it so that it may be used as two independent circuits.

Each of these blocks contains the entire fuse, arrester and cut-out equipment necessary to equip one wire in a branch office. Connection from the line to the instrument is made by a short cord with a double plug upon each end, one plug being inserted in the jack marked "Line" and the other in the jack marked "Table." In a hotel office these plugs may be removed when the office is closed for the night, and the circuit is then continuous through the line jacks. This reduces the liability to interference to the circuit by unauthorized persons.



The general construction of this block is identical with the No. 128½ block described in the June 16th issue, the porcelain bases of these blocks being interchangeable.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

President Clarence H. Mackay, who stopped over at Chicago to attend the Republican National Convention on his way home from Reno, Nev., whither he went to make his gift of a School of Mines building and a statue of his father, the late John W. Mackay, to the University of Nevada, is back again in New York.

Mr. H. C. Shaw, of San Francisco, electrical engineer of the Pacific division, who was in New York lately on company business, and who was accompanied by Mrs. Shaw, is on his way home, breaking the long trip by numerous stops at important cities enroute.

The new combination lunch room and restaurant on the thirteenth floor of the building, provided by this company, mention of which has previously been made, was opened on June 18. Located directly over the operating room, with which it communicates by means of a stairway, it is most convenient of access to those for whose use it is designed. The apartment is of ample size, airy, abundantly lighted by a number of outside windows and numerous electric lights, and with its handsome decoration and furnishing in mission oak, it presents altogether an exceedingly attractive and cheerful interior, a dining room of which Postal employes may well be proud. The neatness of the place, the air of refinement which pervades it, at once favorably impresses the observer. As accommodations are furnished for sixty persons at a time, it is not likely that the room at any time will become overcrowded. It is kept open from seven o'clock in the morning until eleven o'clock at night. An excellent bill of fare is maintained, affording a menu sufficiently tempting to satisfy all reasonable exactions, and at charges that cannot be considered too heavy a tax on the ordinary pocketbook. The kitchen is a model of its kind, the latest appliances in steam, gas and refrigeration having been installed. Mr. T. J. Howlett, who for eight years has had the care of similar accommodations in the Chicago office, is in charge of this undertaking here.

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Another feature of distinct merit just established, also on the thirteenth floor, is a very cosily appointed rest and reading room, designed exclusively for the use of lady operators. It is a good thought well executed, and should be heartily appreciated, as it doubtless will be. All of these improvements carry happily into effect the humanitarian ideas of President Mackay in the praiseworthy endeavor to promote the welfare of employes.

A new and larger office is to be established at Macon, Ga., in the Jaques building, on Fourth street.

Because of extensive additions to be made to the building in which the office at Birmingham, Ala., is located, new quarters are to be occupied at 2004-2006 First avenue, at a point nearly opposite its present location. A handsome office will be established, providing a large receiving room on the first floor, space in the basement, with an operating room on the sixteenth floor. Air tubes, conduits, etc., will connect the lower with the upper floor.

RESIGNATIONS AND APPOINTMENTS.

Mr. W. C. Lloyd, manager at Memphis, has been appointed manager at New Orleans, vice W. A. Porteous, resigned, to enter the practice of law. Mr. Lloyd has been succeeded at Memphis, by J. F. Wilson, chief operator. Prior to his departure from Memphis Mr. Lloyd was the recipient of a handsome cut glass punch bowl and set of cups, presented by the employes of the office.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

President Clowry is again this season, as now for a number of years past, a summer resident of Long Branch, a place for which he has developed a special fondness since making his permanent home in New York. He comes in every day to business, except now and again when he is tempted to take a day off.

Vice-president G. W. E. Atkins will make his home during July and August at Seabright, on the New Jersey coast. Like the Colonel, he will be a regular commuter to and from New York, for he will be found at his desk daily.

General Thomas T. Eckert, chairman of the board of directors, notwithstanding his eighty-seven years, is frequently in attendance at his office and still retains an erectness of figure, vigor of carriage and firmness of speech, the same marked characteristics exhibited in the earlier years of his life.

Mr. George H. Fearons, general attorney of the company, who went abroad early in June, is at Carlsbad, where he is obtaining a much needed rest and finding healthful refreshment in taking the baths at that noted spa. He will probably be absent several weeks still.

RESIGNATIONS AND APPOINTMENTS.

Mr. Fred Fairchild, for many years chief operator at the New Haven, Conn., office, has been appointed manager, vice C. F. Annett, who has been transferred to Goldfield, Nev.

The summer office at Narragansett Pier, R. I., has been opened, with Miss M. A. Newton in charge.

The Railroad.

The Boston and Maine Railroad has installed satisfactorily the telegraphone system on its wires between Boston and Rotterdam Junction, N. Y.

The telegraph school conducted by the Philadelphia and Reading Railway, at Reading, closed on June 30. It has had a useful and successful existence, graduating over ninety telegraph operators.

Mr. F. S. Rawlins has been appointed superintendent of telegraph of the Southern Pacific Company, in effect June 20, with headquarters at San Francisco, Cal., vice A. E. Roome, resigned.

A patent, No. 890,195, for a telegraphone, has been granted to Harve R. Stuart, of Wheeling, W. Va. In this telegraphone there is a uniformly rotating disk, a magnet with an elongated pole face movable over the surface thereof, and means for angularly displacing the pole face during movement.

Under a decision by Judge Tarrant, on June 17, the State of Wisconsin wins in its attempt to secure the enforcement of the eight-hour telegraphers' law. In the test case instituted by Attorney-General F. L. Gilbert against the Chicago, Milwaukee and St. Paul Railroad in the name of Edward A. McGrath, a telegrapher, the court overruled the demurrer made by the road and gave the state a verdict in the sum of $1,000 and costs, amounting in all to $1,050. It is said that an appeal will be taken by the road. According to the allegations in the complaint, Edward A. McGrath, a telegrapher employed by the Milwaukee road, was worked twelve consecutive hours on January 11, 1908. It was claimed that this was done in direct violation of chapter 575, section 1816 of the laws of 1907, which is known as the Eight-Hour Telegraphers' Law. As a penalty, the state asked that damages in the sum of not more than $5,000 and not less than $1,000 be assessed against the road. In its answer and demurrer, the road alleged that many of the trains, orders for which were telegraphed by Mr. McGrath, were interstate trains and were therefore not affected by the Wisconsin law. It was further claimed that the section in question is not constitutional because its provisions are in conflict with the commerce clause of the constitution of the United States.

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$1.50 a year.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

[Continued]

THE PERFORATOR.

[On page 396 of the June 16 issue, on the eighth line preceding the close of the first article of this series, the "space," which should have been represented by three dots (· · ·) on the recording slip was, owing to a printer's error, mutilated into a series of six dots.—Editor.]

The object, principle and action of this machine (a photograph of which is shown in Figure 6) may, before going into the subject-matter in detail, be briefly outlined as follows:

The apparatus is used to prepare a tape upon

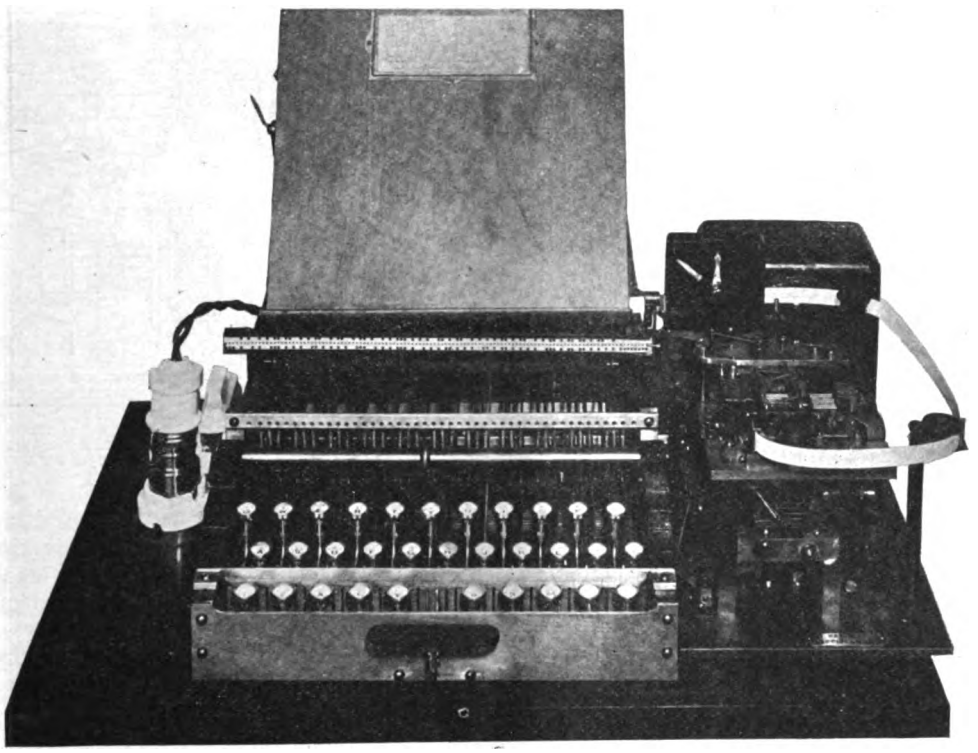

FIGURE 6—PERFORATOR.

which are perforated the various telegraphic characters representing the messages intended for transmission. It is made up principally of a system of levers, bars, links, etc., and a small electric motor, which is suitably geared to operate a clutch and cams when any lever of the keyboard has been depressed.

In the act of depressing a key a certain number of punch levers are selected and brought into line with the particular combination of punches required to perforate the character desired. Simultaneously with this action, one of a series of feed levers is also selected for the purpose of controlling the forward movement of the tape after the latter has been duly perforated.

When the key lever has nearly reached the end of its stroke, a common or universal bar is brought into action which releases the clutch mechanism, and this in turn drives forward the selected punching and feeding levers. The perforations in the paper, and the withdrawal of the punches therefrom, are made a little in advance of the feed movement, after which action all of the mechanism is reset automatically ready for the next cycle of operations. A more detailed description of the various parts of machinery will now be given.

As already intimated, the perforating machine is entirely mechanical with the exception of the electric motor (40, Fig. 7), which is adapted to run at a speed of from 1,800 to 2,500 revolutions per minute when connected with a 110-volt direct-current source of supply. The keyboard is of the universal type, and all of the holes representing a letter or character on the punched tape, as well as the proper spacing thereof, are produced by a single stroke of the key lever. On the underside of each of these levers (2, Figs. 7 and 8) are a series of tits (shown at 45 in Fig. 8) for selecting the proper punches, as well as the feed pins corresponding therewith.

When a key lever is pressed down six punch bars (3, Figs. 7 and 9) and one feed bar (4, Figs. 7 and 11) are carried with it. The punch bars (of which there are sixteen in all) are connected by means of links to bell cranks and punch levers (respectively shown by the numerals 8, 9 and 10 in Fig. 9), the latter being placed directly behind the punches. The feed bars (six in all) connect

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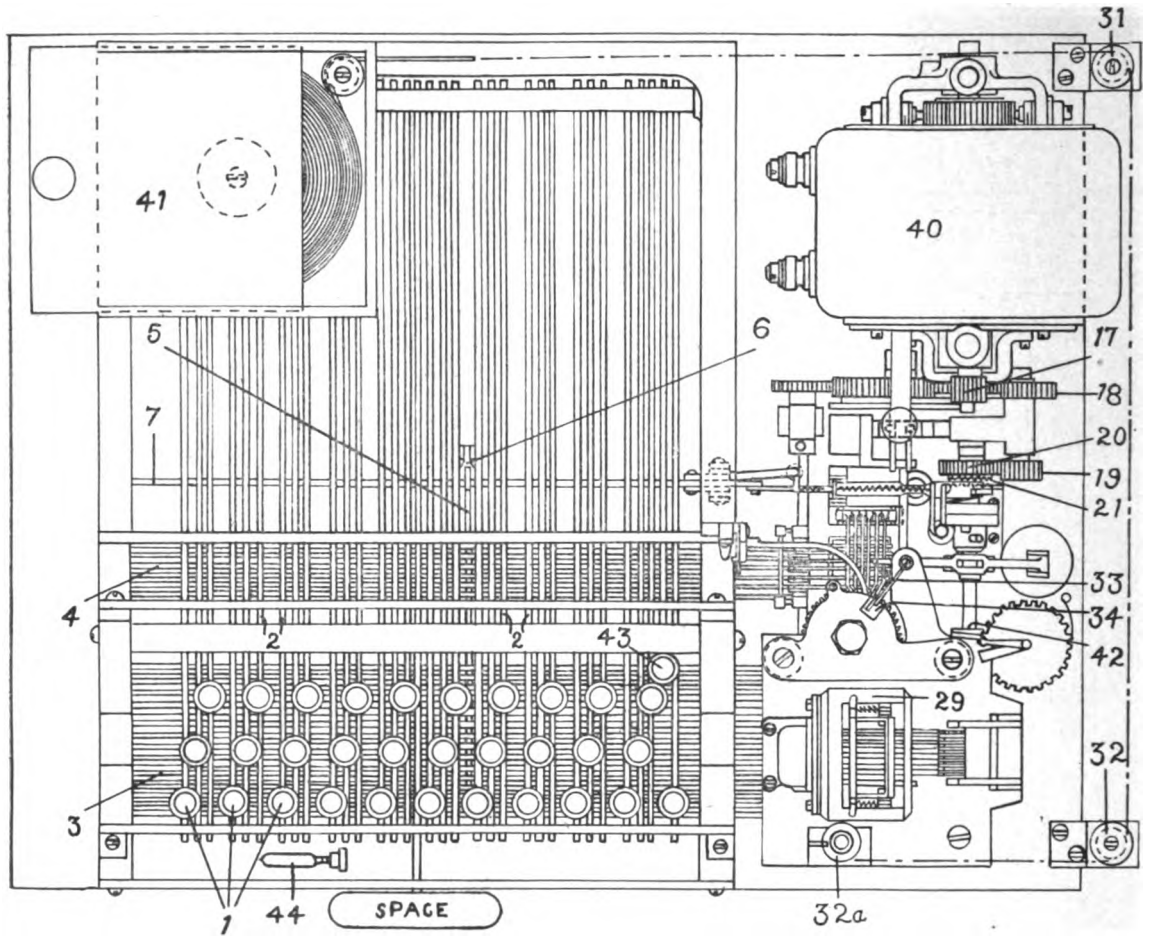

FIGURE 7—PLAN.

through the medium of hook links (11, Fig. 11) with the bell crank feed levers (12) which are placed below a series of cross feed levers (13, Fig. 10) with tits on the lower edge. These crossfeed levers occupy a position immediately below the feed wheel pins (35, Fig. 11) which control the or feed row of holes in the punched tape) as well as with a similar number of selecting pins arranged vertically so as to move either up or down, being held in position by the action of spiral springs.

Under the control of these selecting pins the

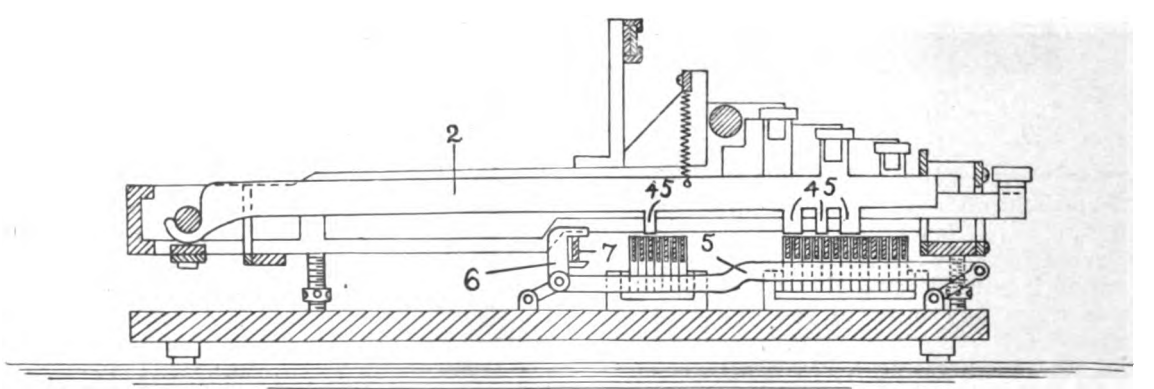

FIGURE 8—SIDE VIEW.

feeding of the tape. The feed wheel (34, Figs. 7, 10 and 11) is provided with fifty small pins rigidly inserted in its periphery and projecting therefrom at intervals of one-tenth inch from center to center (to correspond with the spacing of the center movement of the feed wheel ranges from four-tenths to nine-tenths of an inch, according to the particular letter or character to be selected. The feed wheel is mounted frictionally on an upright shaft, on the lower end of which is a 90° spiral

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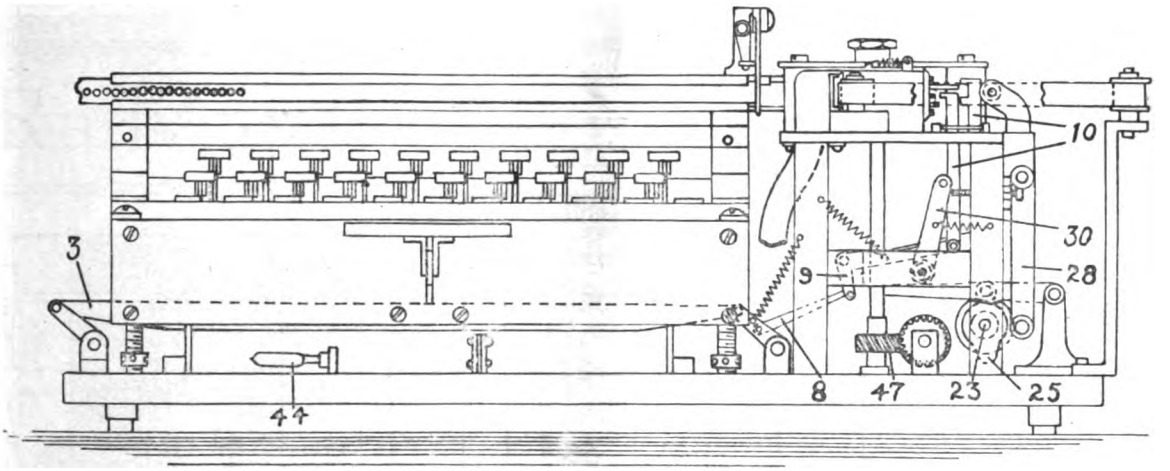

FIGURE 9—FRONT VIEW.

gear (47, Figs. 9 and 11) meshing into a companion gear placed on one end of the horizontal shaft (36, Fig. 11). On the opposite end of this shaft is a spring barrel containing a clock spring, to which is attached at one end a leather shoe (48, Fig. 13), its remote end being fastened by hook and eye to a flat disc (49, Fig. 14). On one side of this disc is the clutch (37, Fig. 14), through which power is transmitted to the feed-wheel. The clock spring is maintained at the required tension by the constant revolution of a drum (50, Figs. 13 and 14) connected with the motor, the tendency being to wind or pull the spring in a direction similar to that in which the drum rotates.

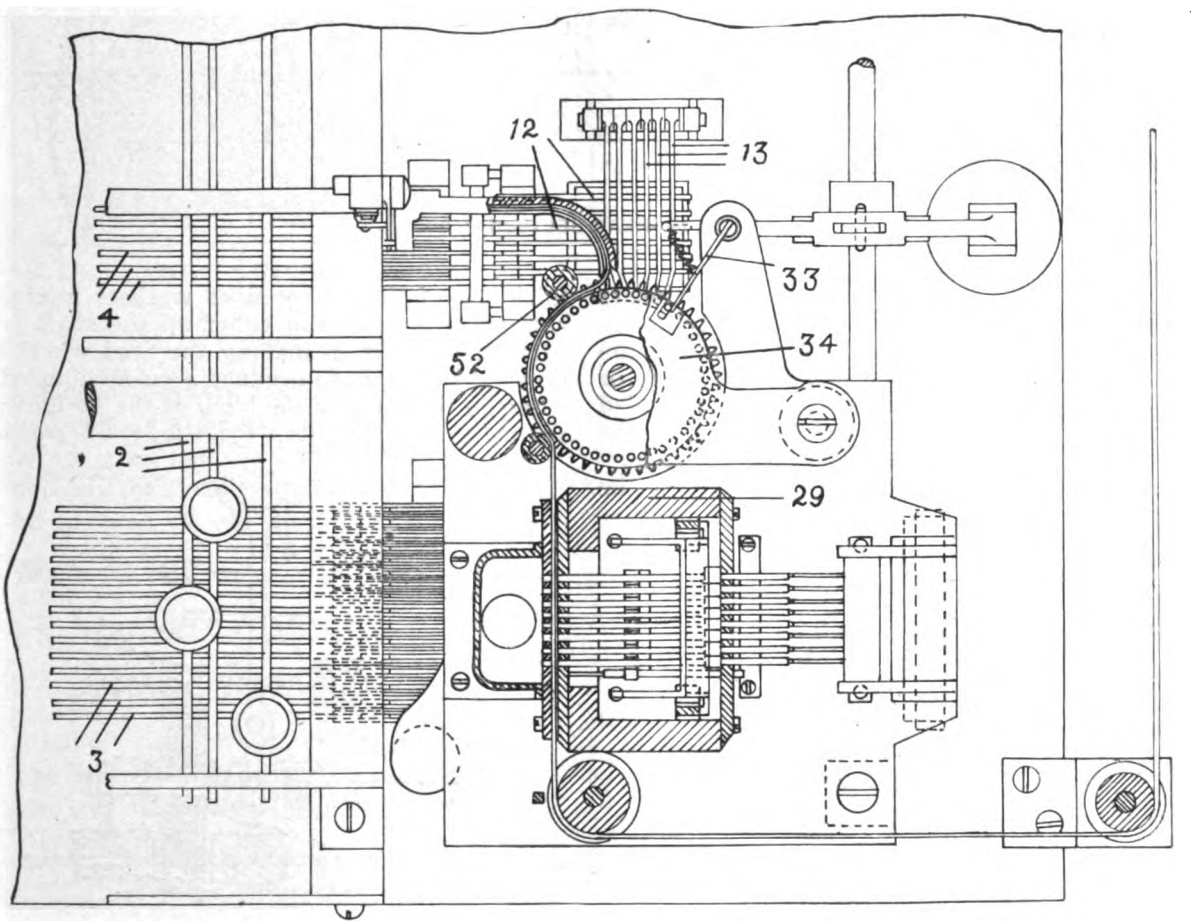

FIGURE 10—SECTIONAL PLAN.

The amount of pull or tension exerted by the

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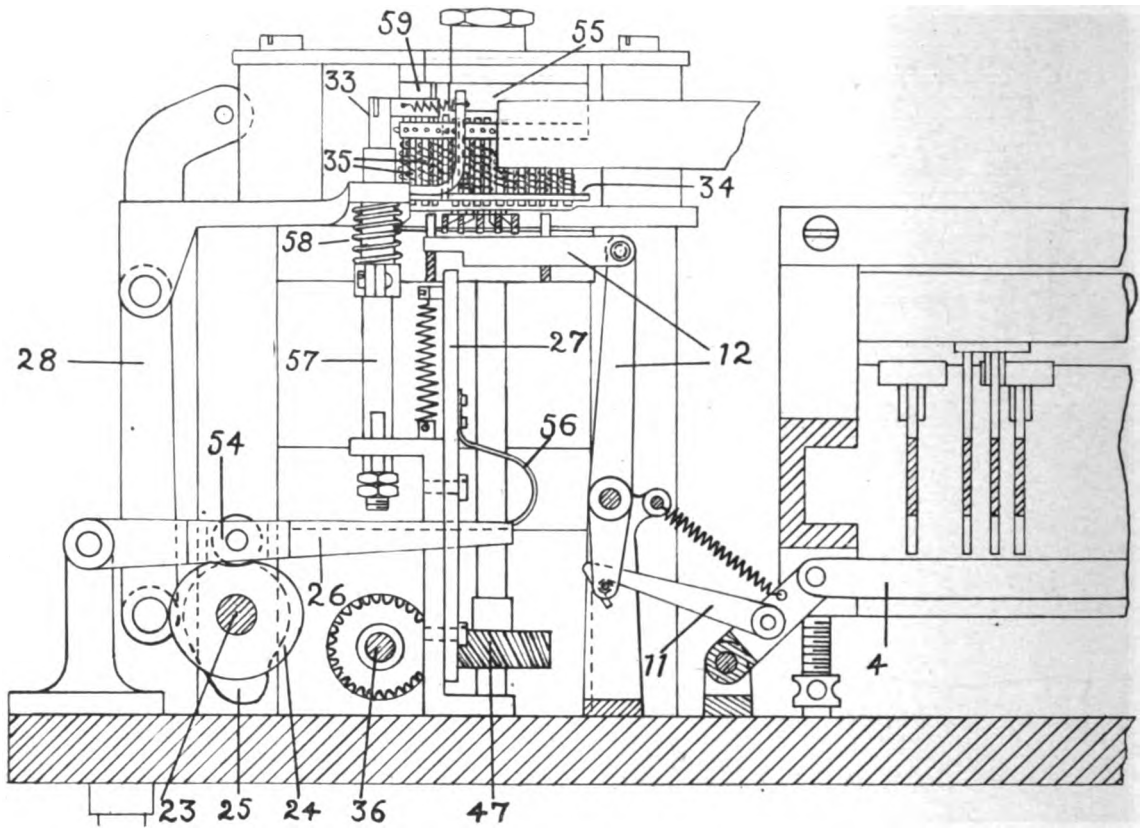

FIGURE 11—REAR SECTIONAL VIEW.

barrel spring should be just enough to insure quick action on the part of the feed wheel when feeding for the various characters. Should the pull be too strong the upright pins will break or bend, or become so wedged in the holes provided for them as to check their movement. If, on the other hand, the pull be too weak, poor "spacing" is liable to result, and possibly a piling of the

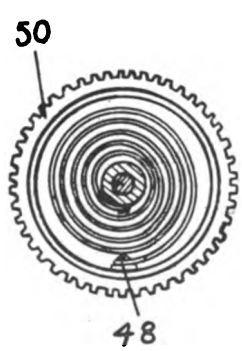

FIGURE 13—SPRING BARREL.

holes in the tape when the machine is operated at high speed. The amount of pull can be regulated by changing the length of the spring, or by opening or closing its convolutions on a suitable arbor. The friction of the feed wheel on its shaft can be adjusted by increasing or reducing the thickness of the felt or fibre washers interposed between the discs and collar on the shaft. The particular object in making the feed wheel friction-tight only, is to produce a cushioning effect, whereby the force of the blow of the upright pins against the limiting stop (59, Fig. 11) is considerably modified in the act of feeding. The amount of this friction should be just sufficient to overcome the pull exerted by the barrel spring.

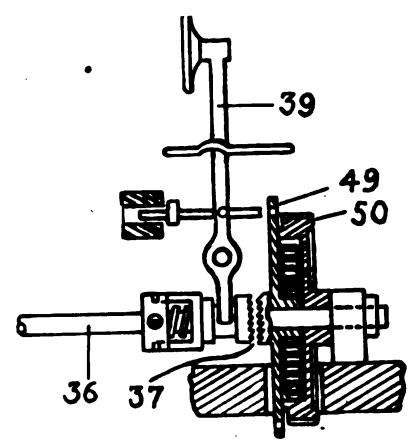

FIGURE 14—SPRING BARREL AND CLUTCH KEY.

(To be continued.)

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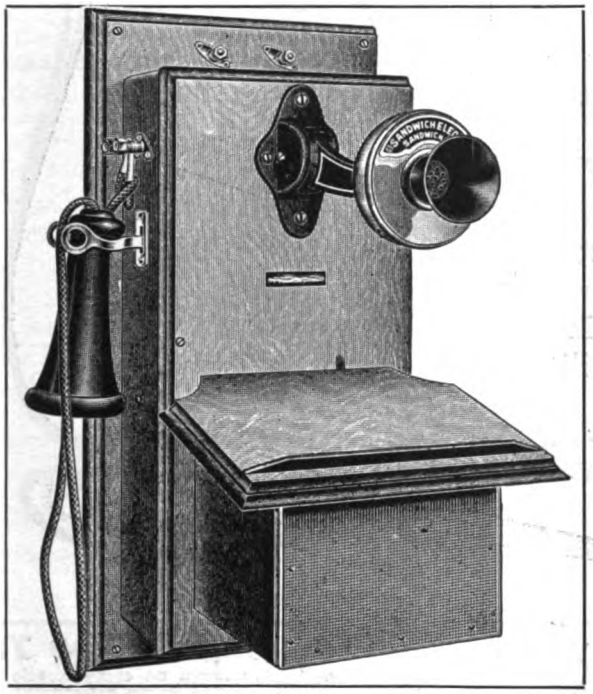
Railway Composite Apparatus



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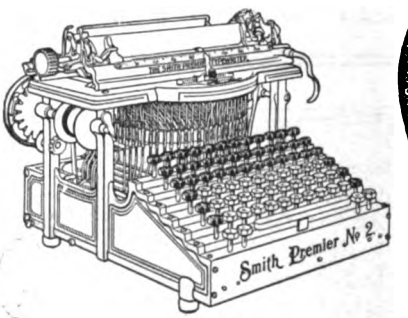

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JULY 1, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

To Investigate the Telegraph.

Under the provision of a resolution adopted recently by the Senate, Secretary Oscar S. Straus, of the Department of Commerce and Labor, has arranged for a thorough investigation of the operations of the telegraph companies of this country, placing the investigation in the hands of Dr. Charles P. Neill, Commissioner of Labor, and Herbert Knox Smith, Commissioner of Corporations. These two will co-operate in the making of the inquiry, Commissioner Neill looking after the labor end, and Commissioner Smith conducting the investigation into the financial affairs of the companies. The report will be ready for submission to the Senate when it reconvenes next December.

Let the Military Telegrapher Be Pensioned.

In the platform adopted at the Republican national convention occurs the following:

Another Republican policy which must ever be maintained is that of generous provision for those who have fought the country's battles and for the widows and orphans of those who have fallen. We commend the increase in the widows' pensions made by the present Congress and declare for a liberal administration of all pension laws, to the end that the people's gratitude may grow deeper as the memories of heroic sacrifice grow more sacred with the passing years.

This declaration pledges the Republican party to liberal views respecting the question of pensions. This is proper when justice is carefully observed and no abuse of the privilege is permitted. The military telegraphers who served in close and vital relationship with the army during the Civil War, whose movements they conserved, frequently with heroism and always with intelligent devotion and patriotism, should now receive the recognition which is their right and be placed upon the pension list of their country. The meting out of strict justice makes this act obligatory on the part of the government, for deserving army war veterans should not be ignored, overlooked or forgotten in any distribution of merited bounty.

In a technical sense these brave men, although acting in and for the army, may be said not to have been of it, because the nature of their services was to a certain extent of a secret character, hence the failure in times past to acquire an army standing, although performing army duties of incalculable value. This absence of an actual army rating, which has shut out this contingent of men from government allowance, was due to the force of circumstances incident to unsettled conditions existing at the close of the war. It is a well-known fact that had President Lincoln lived the standing of the military telegraphers as an integral part of the army would have been admitted and so declared by the enactment of law.

The number of surviving military telegraphers is steadily growing smaller as their heads become grayer and their bodies more feeble; some have need of help while others do not require it. This nation cannot afford to be other than just and generous in the treatment it accords its real defenders who served it faithfully in time of war. The dominant Republican party, by the action of its accredited representatives at Washington, has thus far refused to treat with fairness and right the demands that have been put forward in behalf of the military telegraphers. The pledge to which that great party now stands committed in its declaration, as expressed in a national platform, should so act as to overcome all existing prejudices of "establishing a precedent," behind which platitude refuge has hitherto been taken for refusing to place the military telegrapher on a plane co-equal with that of the American soldier with whom he served, comrade to comrade, in "a time that tried men's souls." A broader sense of justice should in future dominate the congressional mind concerning the question at issue.

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An Instance of Government Telegraph.

Government ownership of the telegraph is not attended with the best results in Canada. It appears that the government owns a telegraph system extending along the north bank of the St. Lawrence river, and that it has not only been diligent in building telegraph lines, but likewise in constructing roads and bridges on telegraph account, particularly within the limits of the electorate of a Mr. Joseph Girard, a member of Parliament from a Quebec district. The acts of the individual politicians are much the same on both sides of the boundary, for it seems that when any construction work is required in the district referred to, Mr. Girard manages to exert a political prerogative in the premises in the matter of appointments. He not only successfully names the foreman, but dictates as well, we are told, the patronage list for the telegraph department, thus affording employment for faithful constituents. So flagrant became the operations in this special telegraphic field that finally the government rubbed its eyes and roused itself to the virtuous belief that something needed to be overhauled. Forthwith an investigation was ordered, and this is the way the Ottawa correspondent of the Toronto Mail and Empire reports the matter:

"J. C. Tache, government engineer, was examined on June 12 before the Public Accounts Committee respecting the government telegraph lines on the north shore of the St. Lawrence river. He was examined by Mr. Ames (Conservative, Montreal), who sought to show by the witness that there had been unnecessary duplication in constructing telegraph lines. He admitted that there were not less than three parallel lines between Chicoutimi and Tadousac. It also appeared that many small branches were built, some only one or two miles long. This was explained by the fact that it is difficult to procure operators. The government found it necessary to extend a wire to the home of anyone who could be procured to act as telegraph operator. Mr. Tache admitted that many branch lines were built to accommodate a single lumberman or corporation. In nearly all these cases the government not only furnished the poles and wires, and paid for the cost of construction, but it also paid for the right-of-way across private property. In one case the government built a bridge at a cost of $200.

"Witness justified this expenditure on the ground that it would facilitate the linemen in doing their work. Mr. Ames thought that the bridge was probably built to accommodate the school children in that neighborhood. It seemed peculiar that a telegraph line running on one side of the river only could be benefitted by constructing a bridge across the stream, and at right angles with the line.

"In another case the witness admitted that a municipal bridge had burned down, and that, instead of the bridge being built by the municipality, the Dominion Government contributed to the cost of reconstruction, and charged it to the telegraph department. In a third case in this district, a bridge was built entirely at the cost of the telegraph department, although it was part of a municipal highway.

"The Dominion Government seems to have been busy in helping out Quebec municipalities. In one case, $1,000 was expended in repairing a road, but Mr. Tache claimed it was necessary as a maintenance of way expense.

"Mr. Tache was quite frank about how these improvements were carried on. Whenever a work was determined on, he said that he applied to Mr. Girard, M. P. for the district, who appointed a foreman. The foreman, in turn, employed all the men. In buying supplies, he was guided by the advice of the member."

History Pleads for Them.

The Binghamton (N. Y.) Press recently published an editorial on "Pension the Telegraphers." The article advocated giving the military telegraphers who served so faithfully during the Civil War the same recognition accorded to the officers and soldiers. Attention was called to the fact that the greatest generals in the northern armies many times recognized the value of the services rendered by the military telegraph corps. The paper in question printed a copy of a telegram received from Joseph Schnell, a resident of Binghamton, which passed through his hands in the course of his duties when serving as a military telegrapher, and which is as follows:

Time Recd., 1 p.m.

U. S. Military Telegraph, War Department,
Washington, D. C., Feby. 2, 1863.

From Murfreesboro, Feby. 2, 1863.
To Col. Stager, Gen'l Supt. U. S. Mil. Teleg'h.

I think the cutting down of the pay of headquarters operators here prejudicial to our interests. Those at my headquarters do more work and have more responsibility than any captain in the service.

That such men should have less honor, consideration and compensation than common soldiers is not right. We do not want snipes of boys in such positions; yet your salary to them is not better than is given to the porters of warehouses in our large cities. Justice ought to be done and the laborer should have what he earns. Please have this corrected and oblige, your friend,

W. S. ROSECRANS,
Major General.

The historical protest of the hero of Iuka and Corinth pleads for the old time war telegraphers as strongly now as when it was clicked over the wires over forty-five years ago. It is part of the official records of the war. It tells the story of the wrongs of the war operators, and what they should have, in a nutshell. In making it public, Mr. Schnell says that he has no direct interest in the movement to pension the war telegraphers, as he himself is pensionable. But he makes it public in justice to the great number of war telegraphers who are not now in the pensionable class, although deserving that honor and reward as much as any of the veterans now on the rolls.

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THE RAILWAY TELEGRAPH SUPERINTENDENTS MEET IN CONVENTION.

The convention of the Association of Railway Telegraph Superintendents, which held its twenty-seventh annual meeting this year at Montreal, commencing a three days' session on June 24, brought together many of the brightest minds in the higher telegraph service of the railroads of this continent, the attendance being the largest in the history of the association. As anticipated, the use of the telephone in train despatching was the theme that dominated the convention. Its utility for the purpose named was abundantly recognized. Its value was set forth in papers read and in the discussions that followed, arousing enthusiastic approval; the same thought likewise illuminating much of the conversation current in the leisure hours of social intercourse. The subject was well

WILLIAM J. CAMP, OF MONTREAL.
President of the Association of Railway Telegraph Superintendents.

covered in the excellent paper of W. W. Ryder, published in full on another page of this issue. The social features of the occasion were highly enjoyable and served to bring together all present in pleasant intercourse, promoting friendship and acquaintance not only between the active members themselves, but among their wives and others accompanying them; the associate and and honorary members and those who attended in their capacity as manufacturers, or sales agents, exhibiting instruments and mechanisms of a character interesting to the superintendents. Some of the working exhibits shown reflected the utmost credit as models of skillful manufacture and of intelligent and forceful application.

A notable feature of the convention was its very delightful international character. The holding of such a convention on Canadian soil—to become the recipients of such a generous welcome, of such a whole-hearted hospitality, as was extended to the visitors, was, as a superintendent remarked, "calculated to act as a distinct aid in advancing any future treaty-making programme."

The convention was called to order at ten o'clock on the morning of Wednesday, June 24, the point of assembling being in the "Ladies' Ordinary" of the Windsor Hotel, Montreal. E. P. Griffith, of New York, president of the association, and superintendent of telegraph of the Erie Railroad, was in the chair. In addressing the convention, Mr. Griffith expressed the satisfaction he felt in observing so numerous a body before him, remarking that the meeting was probably the largest attended gathering of railway telegraph superintendents in the history of the association. He then introduced Alderman Sadler, of Montreal, who in a pleasant speech bade the delegates welcome to Canada's chief city. The alderman was succeeded by the vice-president of the Business Men's League, who was very happy in his remarks, and who very graciously tendered a bouquet of flowers to Miss Griffith, the daughter of the president, who was present as the representative of her mother, on the occasion. To the felicitous words spoken and the special act of welcome, President Griffith made fitting response, following which he plunged at once into the business awaiting his attention.

W. J. Camp, of Montreal, vice-president of the association, and chairman of the committee on arrangements, was the first to respond by the reading of his report, which, in addition to his own, bore also the signature of W. W. Ashald, of Montreal.

Next came the election of new members, as follows:

B. B. Baughman, superintendent of telegraph, Wheeling and Lake Erie Railroad, Canton, O.; E. R. Bonnell, supervisor and train despatcher, Cleveland, Cincinnati, Chicago and St. Louis Railway, Indianapolis, Ind.; George Boyce, signal engineer, Chicago, St. Paul, Minneapolis and Omaha Railway, St. Paul, Minn.; F. G. Boyer, superintendent of telegraph, National Transit Company, Oil City, Pa.; F. M. Brown, superintendent of telegraph, Pittsburg and Lake Erie Railroad, Pittsburg; J. P. Church, chief clerk of the telegraph department, Wabash Railroad, Decatur, Ill.; W. L. Connelly, superintendent of telegraph, Chicago, Indiana and Southern Railroad, Gibson, Ind.; E. E. Dildine, assistant superintendent of telegraph, Northern Pacific Railway, St. Paul, Minn.; A. Hatton, inspector of transportation, Canadian Pacific Railway, Winnipeg, Man.; F. T. Jennings, superintendent of telegraph, Canadian Pacific Railway Company's telegraph, Sudbury, Ont.; W. M. Johnson, Jr., trainmaster, Bessemer and Lake Erie Railroad, Greenville, Pa.; M. W. Maguire, general superintendent, Norfolk and Southern Railway, Norfolk, Va.; W. Marshall, superintendent of construction, Canadian Pacific Railway, Toronto, Ont.; R. W. Mitchener, division superintend-

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ent, New York, Chicago and St. Louis Railroad, Cleveland, Ohio; George Reith, superintendent, Virginia Railway, Norfolk, Va.; Thomas Rodger, inspector of telegraphs, Grand Trunk Railway, Montreal, Que.; George T. Rooke, inspector of train despatching, Canadian Pacific Railway, Montreal, Que.; J. B. Sheldon, superintendent of telegraph Union Pacific Railroad, Omaha, Neb.; F. W. Smith, chief train despatcher, Bessemer and Lake Erie Railroad, Greenville, Pa.; P. W. Snider, superintendent of telegraph, Canadian Pacific Railway Company's telegraph, St. John, N. B.; H. D. Teed, superintendent of telegraph, St. Louis and San Francisco Railroad, St. Louis, Mo.; G. C. Todd, superintendent of telegraph, New York, Chicago and St. Louis Railroad, Cleveland, O., and R. N. Young, assistant superintendent of telegraph, Canadian Pacific Railway Company's telegraph, Winnipeg, Man.

The following named were elected to associate membership:

A. A. Bullen, assistant superintendent Contract Department, New England Telephone and Telegraph Co., Boston; A. B. Conover, John A. Roebling's Sons' Co., Chicago; W. E. Crowell, special agent, New York Telephone Company, New York; H. D. Crouch, sales manager Northern Electric and Manufacturing Company, Ltd., Montreal, Que.; L. C. Hall, special agent, New York and New Jersey Telephone Company, Newark, N.J.; W. E. Harkness, Western Electric Company, New York; L. M. Hemenway, assistant engineer, Ericsson Telephone Manufacturing Co., Buffalo, N. Y.; W. E. Hinman, sales agent, Egry Register Company, Dayton, O.; F. C. Hirsch, manager telegraph system of Canada, Montreal, Que.; M. E. Launbranch, Western Electric Company, New York; E. C. Lewis, Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y.; Franklin H. Reed, American Telephone Journal, New York; H. B. Shepard, special agent, Central New York Telephone Company, Syracuse, N. Y.; H. C. Slemin, advertising manager Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y.; Geo. F. Wiley, special agent railways, Bell Telephone Company of Pennsylvania, Philadelphia; Archibald Wray, telegraph engineer Kellogg Switchboard and Supply Company, Chicago.

The honorary members elected were: Wendall Baker, of New York; L. H. Korty, of Omaha, Neb.; F. G. E. Ferguson, of Vicksburg, Miss., and H. C. Sprague, of St. Louis.

The secretary and treasurer, P. W. Drew, of Chicago, read his report, which showed the association to be in a very satisfactory financial condition.

The convention then passed resolutions of thanks to the telegraph and telephone companies for courtesies extended.

This acknowledgment completed, J. L. Davis, of Chicago, chairman of the committee on topics, made his report. He said that there had been a very general response to invitations to furnish papers on railroad subjects, as the number to be read would show, and that the excellent character of the papers themselves indicated the exercise of much thought and care on the part of writers in their preparation.

The first paper to be read was that entitled "Despatching Trains by Telephone," by W. W. Ryder, and which as previously stated, is published in full in another column. This able paper was especially well received, and was discussed at length by S. L. Van Akin, Jr., of Syracuse, N. Y., assistant superintendent of telegraph of the New York Central Railroad.

He said that to successfully despatch trains by telephone, on account of the important nature of the work, it was necessary for the pioneers in the field to do considerable engineering in bringing about a departure from established precedent, both in the method of construction and operation. Defects in local battery telephone sets, from a service standpoint, were carefully considered, some of which are as follows:

When a receiver is left off the hook, the bridging bells on a party line cannot be freely operated on account of the short circuit, and in case two or more parties are wanted, the first party called is obliged to "hang up' until the other stations are signaled, and, as sometimes found, the insulation on the hook becomes carbonized, thus failing to cut the receiver out —or partially so—cutting down the ringing of bells, while it would not noticeably cut down transmission. When the receiver is removed from the hook, the transmitter circuit is closed as well as the receiver circuit which often times will cause interruption to communications between other offices on the line, due to speaking before listening, vibration from telegraph instruments, engines whistling or ringing bells, or noise from passing trains.

To obviate these objectionable features, it was recommended that a 2 m.f. condenser be placed in the receiver circuit, and about the time the New York Central was ready to place an order for equipment, we were able to obtain receivers of 700 ohms resistance. The 700-ohm receiver wired in series with the secondary winding of the induction coil (which is standard practice) and a 2 m.f. condenser across the line, brought the bridging resistance of the set, when operative, up to approximately 970 ohms, and with twenty or more stations so equipped, and cut in circuit, it was found that as many bridging bells in series with a 2 m.f. condenser would freely operate. To prevent interruption to communications between other offices, when listening in, it was recommended that a line key and a transmitter key be installed at the outlying offices, the line key being locking, the transmitter key non-locking. In this particular class of work, as it is essential that an operator have the free use of both hands, it was therefore deemed expedient to design a telephone arm having mounted upon it a transmitter and a receiver. The latest improvement in this connection is on exhibit.

With a transmitter and receiver mounted in a fixed position on an arm, it follows that if the ear is pressed to the receiver, the mouth is brought close to the transmitter mouth-piece, insuring good transmission; head telephones were not recommended for use except by the train despatcher, who wears a chest transmitter, on account of the wear and tear on cord, and the liability to breakage, and a tendency not to speak directly into the transmitter with this type of apparatus.

Bridging bells were installed at every third station for emergency use only, as it was not advisable to use ringing current on the line except as stated (for emergency calling) for the following reasons: The first and most important is the liability to de-magnetize receivers; in this respect we have experienced considerable trouble at Ravena, N. Y., which is the monitoring station for our long distance telephone lines; the

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receiver at that point is de-magnetized and a new receiver required on an average of every thirty days, due to ringing in the wire chief's ear; second, ringing in operator's ear; third, confusion of bells ringing incessantly where the lock and block signal system is in use, as in our case; fourth, a bridging bell would be required at each station on the line, tending to cut down transmission.

With these facts in mind it was recommended to install the Gill telegraphic selectors on the old despatching Morse circuit, and to provide automatic sending keys at the despatcher's office. This was done, but proved a failure, first, because being too slow, and, second, because unreliable, due entirely to outside interference in breaking up the combinations. After much experimenting and hard work by all concerned the Gill telegraphic selector, new type, was finally installed, being the third installation tried out. It is operated over the telephone line, the service being very satisfactory and the operation absolutely reliable.

Arrangements are now being made to extend the original circuit to Little Falls, N. Y., with an additional eight stations, making a total of twenty-five stations, in a circuit seventy-three and one-half miles in length.

Our experimental circuit between Albany and Fonda, forty-four miles long, was ready for service September 29, 1907, but was not made operative until October 2, as the railroad company were not able to meet the conditions of the nine-hour law (New York State, effective October 1, 1907), with telegraph operators, and, for obvious reasons, it was thought best to commence operations by telephone after the conditions of the law had been met. The spirit of antagonism toward telephone train despatching has been very pronounced with us from time to time during the past nine months, but the issues have been successfully met.

I appreciate this opportunity to endorse what Mr. Ryder has said with regard to the practicability and superiority of the telephone over that of the telegraph in the handling of train movements.

The entire afternoon of the first day was given up to an executive session held behind closed doors, the subject considered being the telephone situation.

The ladies of the party were entertained during the day by the committee of Montreal ladies under the direction of Mrs. W. J. Camp. Late in the afternoon, however, the entire attendance at the convention, entertained as guests of the Grand Trunk Railway, were conveyed by train to Lachine and there transferred to a steamer, the return to Montreal being accomplished by water, "shooting" the famous Lachine rapids on the way.

On Thursday, June 25, the second day of the proceedings, the convention was called to order by President Griffith. He announced that J. J. Ghegan, president of J. H. Bunnell & Company, Inc., of New York, would send a souvenir telegraph sounder to each member. Letters of regret were read from H. C. Hope, of St. Paul; C. F. Annett, of Goldfield, Nev.; W. I. Conolly, of Angelica, N. Y.; E. E. Torrey, of Jackson, Tenn.; B. S. Jenkins, of Winnipeg, Man., and B. Brooks and C. H. Bristol of New York.

At this point the reading of papers commenced, the first bearing the title of "Commercial Reports," by Joseph P. Church, of Decatur, Ill., chief clerk of the telegraph department of the Wabash Railroad Company, of which system G. C. Kinsman is the superintendent of telegraph. Another paper, entitled "Reduction of Telegraphing By Use of Printed Forms," by O. C. Greene, of St. Paul, Minn., superintendent of telegraph of the Northern Pacific Railway, was read by J. L. Davis, of Chicago, owing to the absence of the author.

At this point Acting Mayor Narcisse Lapointe was introduced to the convention. In a brief speech he heartily welcomed the superintendents to the city of Montreal. He expressed his pleasure in appearing before such a representative membership of the railroads and hoped cordially that each of the delegates would find in his visit entertainment as well as instruction.

After the acting mayor had retired, much animated discussion, participated in by many, was had on the paper of Mr. Greene.

President Griffith pleasantly varied the proceedings by reading two old telegrams, one received in New York in 1851, and the other at St. Catharines, Ont., in 1848. Mr. Charles Selden, of Baltimore, suggested facetiously, that an investigation should be made to ascertain the cause of their delay.

Mr. U. J. Fry, of Milwaukee, superintendent of telegraph of the Chicago, Milwaukee and St. Paul Railroad, furnished a paper entitled "Dry Batteries and Telegraph Circuits." Mr. Fry was unable to be present and the services of Mr. J. L. Davis were again brought into requisition as a reader.

In the discussion that followed the reading of this paper Mr. J. J. Ghegan, of New York, explained at some length the form of telegraph keys used in dry battery open circuit work. W. F. Williams, of Portsmouth, Va., stated that in his service on the Seaboard Air Line they averaged 1½ cells of dry battery to the mile of wire.

A pleasant reminiscence of the former meeting of the association at Montreal in 1895 was had in the reading, by Secretary P. W. Drew, of an interesting letter from J. W. Fortune, who at the date mentioned was assistant general manager and superintendent of telegraph of the Grand Trunk System, and chairman of the entertainment committee.

Mr. E. A. Chenery, of St. Louis, superintendent of telegraph of the Missouri Pacific System, read his paper treating on "Adverse Railroad Legislation." His subject was one of peculiar interest inasmuch as it carefully considered the trend of legislative action in its effects on the railroads.

During the time between the closing of the reading of Mr. Chenery's paper and the noon recess, the convention went into executive session behind closed doors.

The first matter taken up at the afternoon meeting was the reading of the paper, "Past, Present and Future of the Association of Railway Telegraph Superintendents," by W. F. Williams, of Portsmouth, Va., superintendent of telegraph of the Seaboard Air Line Railway. The reading of

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this paper brought Charles Selden, of the Baltimore, and Ohio Railroad, to his feet in reminiscent rejoinder, for he, together with William Kline, of Toledo, superintendent of telegraph of the Lake Shore and Michigan Southern Railway, were instrumental in the formation of the association twenty-seven years ago. Mr. Selden reviewed briefly the object which prompted its organization, and dwelt on the working out of ideas which have since imparted to the association its present strength, scope and influence. Mr. Kline, who ranks as the dean of the railway telegraph superintendents, also further considered the subject, and in particular expressed his pleasure at seeing so many young and active superintendents taking up the burdens of their office and managing them thoroughly in the intersts of the railroad companies.

Mr. C. S. Rhoads, of Indianapolis, superintendent of telegraph of the "Big Four," read his paper on "Qualifying Operators for Train Despatching," which was discussed at some length by Charles Selden, W. J. Camp, of Montreal; A. Hatton, of Winnipeg; George T. Rooke, of Montreal, all of whom explained the methods employed on their respective systems in instructing and qualifying men for duty and placing the same in the line of promotion. Many railroads, it was said, were extremely careful in their selection of operators to fill vacancies in the ranks of train despatchers. On some roads the services of a copying operator were in use, and from these a choice was made when vacancies occurred, a view of the subject which was thrashed out in a thorough way by W. W. Ryder, F. H. Van Etten, of Chicago, and W. P. McFarlane, of Omaha.

Detroit, Mich., was selected for the next place of meeting in 1909.

Then came the election of officers for the ensuing year, the choice of president being unanimously centered upon Vice-president William J. Camp, of Montreal, electrical engineer of the Canadian Pacific Railway Company's telegraph. G. W. Dailey, of Chicago, superintendent of telegraph of the Chicago and Northwestern Railway, was made vice-president, and P. W. Drew, of Chicago, superintendent of telegraph of the Wisconsin Central Railway, was returned by acclamation to the post of secretary and treasurer, held continuously by him since 1883. Mr. Camp and Mr. Drew thanked the convention for the confidence reposed in them, in their selection.

The outgoing and incoming presidents exchanged courtesies, and President Camp on assuming the chair, called for the reading of J. H. Jacoby's paper entitled "Wiring of Station Buildings from the Contractor's Standpoint." This paper was discussed at some length by Messrs. Selden, Camp, Drew and others, who gave the methods in use on their respective systems of running wires into the smaller stations, both underground and aerial. It was the opinion of some of the delegates that not enough attention was paid to this important subject, and Mr. Jacoby drew attention to simple methods that could be followed with a view of greatly improving the appearance of small stations.

At the opening of the session of the third day, Friday, June 26, the paper of William Maver, Jr., of New York, on "Wireless Telephony," was read. This paper dealt with its subject in a thorough and complete manner, giving a history of the development of this branch of the electrical art from its inception. At its conclusion Mr. J. L. Davis of Chicago, chairman of the committee on topics, took occasion to thank Mr. Maver for his valuable contribution, considered both from a literary and a technical standpoint. Other members voiced expressions of satisfaction over the manner in which this comparatively new subject had been treated.

Mr. L. B. Foley, of New York, superintendent of telegraph of the Delaware, Lackawanna and Western Railroad stated that his road had used the wireless telephone system with satisfactory results between their Hoboken terminal and the various ferry boats of their fleet. The distance over which conversation was carried on satisfactorily was two miles.

Mr. G. W. Dailey, of Chicago, the newly elected vice-president, in responding to calls upon him to address the meeting, took occasion to thank the delegates for the confidence reposed in him, expressed so flatteringly in elevating him to the vice-presidency. He was glad, he said, to cooperate with the other officers and members in the interests of the railway service.

Considerable desultory discussion then followed on various subjects, during which facts were brought out showing that telephone train orders were at present used on many roads for single track operation, among them being the Burlington System, Chicago and North Western, Illinois Central, Lackawanna, Michigan Central and others.

The convention then decided that the next meeting should take place on June 24, 25 and 26, 1909, at Detroit, as previously agreed upon.

A. B. Taylor, of New York, superintendent of telegraph of the New York Central, and E. H. Millington, of Detroit, superintendent of telegraph of the Michigan Central, were appointed a committee to draft resolutions thanking the various companies for courtesies extended in contributing to the entertainment of the delegates at Montreal. These included the telegraph and railroad companies, the Pullman Car Company, Mr. C. R. Hosmer, of Montreal, and various other interests.

Mr. J. L. Davis was instructed to inform Mr. F. F. Fowle of Chicago, who was unable to be present, that his paper on "The Telephone" would be incorporated in the minutes of the association.

A committee, consisting of Messrs. G. A. Cellar, G. H. Groce, G. W. Dailey, E. H. Millington and Charles Selden, was appointed to consider the question of high-tension wires crossing railroads. Considerable discussion ensued as to the duties of the committee. The conclusion reached was that

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members of the association wishing forms, rules and regulations governing the crossings of railways by foreign wires should be furnished with what they desire for legislative enactment. While some of the states had adopted laws governing this important subject, other states had taken no action whatever, with the result that no prescribed forms were observed. Many of the crossings were dangerous, and it was the sentiment of many of the superintendents that uniform legislative action should be secured in every state.

The convention then adjourned sine die.

By general consent the convention at Montreal was declared to be the largest, best and most successful of the series ever held. There were over one hundred and fifty active and associate members present, more than double the number in attendance at any previous meeting. The social side of the affair afforded an agreeable digression from the demands of business that brought the superintendents together. Trolley rides about the city were undertaken, quaint out-of-the-way localities were visited, and the architecture of another day and race, with which the city affords many interesting examples, was inspected. Everybody seemed delighted with what was done for them and with what they saw. Perhaps the greatest charm afforded the visitors was beautiful Mount Royal, from which height, above the city of Montreal, a magnificent and extended panoramic view of water and land scenery greeted and held spellbound the vision.

On Friday night fully two-thirds of the delegates departed for Quebec, one hundred and sixty miles distant down the St. Lawrence river. This was "the" excursion incident to the convention. Here Saturday, June 27, was passed, and it may be said that the old city of Quebec, still so essentially French in its characteristics, was thoroughly explored. Mr. Edwin Pope, superintendent of the Great North Western Telegraph Company, together with his daughter, joined the party here, and to him much of the pleasure of the visit was due, for he accompanied the excursionists everywhere and pointed out the many attractions of the town. Mr. E. A. Evans, general manager of the trolley railroad system of Quebec, furnished special cars for the accommodation of the visitors to convey them to the celebrated shrine of St. Anne de Beaupre, stopping at the beautiful Montmorency Falls.

Montreal was reached on return on Sunday morning, June 28, where the excursionists finally separated. The convention of 1908 had passed into history.

Mr. and Mrs. William J. Camp exerted themselves in every way possible to promote the comfort and pleasure of the visiting superintendents and other friends. Mr. Camp was most assiduous in his attentions, and the many courtesies extended the visitors by the Canadian Pacific Railway Company, of which corporation Mr. Camp is the electrical engineer of the telegraph department, were no doubt due to his instrumentalities. They were conferred in a manner and on a scale at once so gracious and so generous as to arouse hearty appreciation and to elicit many expressions of gratitude. Nor will the delightful dinner tendered to a few friends at Mr. Camp's residence on Sunday evening, prior to their departure at a late hour for their homes on this side of the border, be forgotten. It will dwell in the minds of all who were present as a charming memory expressive of hospitality, good will and companionship.

The ladies of the party expressed their sense of obligation to Mrs. Camp for the many kindly attentions shown them, by presenting her, through Mrs. P. W. Drew, wife of the secretary and treasurer of the association, with a beautiful silver card receiver bearing a suitable inscription.

Among those present at the convention were:

Angelica, N. Y.—C. L. Lathrop and wife.

Baltimore, Md.—Charles Selden.

Boston, Mass.—A. N. Bullen, E. A. Smith, S. A. D. Forristall.

Buffalo, N. Y.—L. M. Hemenway, H. C. Stephen.

Canton, Ohio.—B. B. Baughman.

Chicago, Ill.—G. W. Dailey, John L. Davis, wife and son; P. W. Drew and wife; A. G. Francis, wife and two sons; J. C. Kelsey, W. W. Ryder and wife; F. H. Van Etten, E. W. Vogel and wife; Archibald Wray.

Cleveland, Ohio—G. C. Todd and wife.

Dayton, Ohio.—W. E. Hinman.

Decatur, Ill.—Jos. P. Church and wife.

Denver, Colo.—E. E. McClintock.

Detroit, Mich.—E. H. Millington.

Indianapolis, Ind.—C. S. Rhoads.

Kansas City, Mo.—R. L. Logan and wife; Val B. Mintun.

Lexington, Ky.—W. S. Melton and son.

Lincoln, Neb.—V. T. Kissinger and wife.

Los Angeles, Cal.—I. T. Dyer.

Minneapolis, Minn.—L. H. Merrill.

Montreal, Que.—W. W. Ashald and wife; W. J. Camp, wife and daughter; Frank Camp, L. S. Humes, L. B. McFarlane and wife; S. B. Kramer, Thos. Rodger, wife and daughter; George T. Rooke, James Kent and wife.

Newark, N. J.—L. C. Hall.

New Haven, Conn.—F. E. Clary, N. E. Smith.

New York—W. F. Crowell, H. D. Crouch, A. P. Eckert and wife; L. B. Foley and wife; J. J. Ghegan, wife and daughter; E. P. Griffith, wife and daughter; W. E. Harkness, B. A. Kaiser, Howard E. Merrell and wife; Wm. Maver, Jr., wife and daughter; F. H. Reed, F. G. Sherman and wife; J. B. Taltavall, wife and daughter; A. B. Taylor and wife; R. D. Brixey, P. W. Miller, John Langan, George L. Foote, M. E. Launbranch.

Oil City, Pa.—F. G. Boyer and wife.

Omaha, Neb.—W. P. McFarlane, J. B. Sheldon.

Philadelphia, Pa.—J. B. Fisher, J. O. Oliver, Geo. F. Wiley.

Pittsburg, Pa.—F. M. Brown, G. A. Cellar, G. A. Dornberg, G. E. Lawlor.

Portsmouth, Va.—W. F. Williams, wife and two daughters, and Misses E. N. and Jane Neely.

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Reading, Pa.—C. M. Lewis.
Richmond, Va.—J. S. Stevens.
Roanoke, Va.—W. C. Walstrum and daughter.
Rochester, N. Y.—Chas. E. Hague and wife; E. C. Lewis and wife; H. C. Slemin, S. R. Wright and wife.
Salt Lake City, Utah—B. F. Frobes and wife.
St. Albans, Vt.—M. Magiff and wife.
St. John, N. B.—P. W. Snider and wife.
St. Louis, Mo.—E. A. Chenery and son; N. R. File, H. D. Teed.
St. Paul, Minn.—Geo. Boyce, E. E. Dildine.
Sudbury, Ont.—F. T. Jennings and wife.
Syracuse, N. Y.—B. H. Shepard, S. L. Van Akin, Jr., and wife.
Toledo, Ohio—Wm. Kline.
Toronto, Ont.—I. McMichael, W. Marshall.
Valparaiso, Ind.—G. M. Dodge and son.
Wilmington, N. C.—W. P. Cline, wife and daughter.
Winnipeg, Man.—A. Hatton, R. N. Young.

EXHIBITS AND EXHIBITORS.

The Western Electric Company had on exhibition a complete line of telephone equipment for use in railway service. This included special transmitter arms to be used in connection with train despatching, besides other telephone equipment for use in conjunction with such service. Then there was a full line of composite telephones, such as wall sets, portable sets and line poles; also weather-proof wire pole telephone sets, besides portable car sets for regular telephone lines. In addition to this a complete collection of telegraph equipment was displayed. The Gill and Burlington selectors, both of which are sold by this company, and which were included in the display, were shown in operation. A very attractive feature of this exhibit was a large artistic sign beautifully decorated with small flags of all nations, showing the countries where Western Electric apparatus is used. The Western Electric Company was represented by W. E. Harkness, sales engineer, and M. E. Launbranch, engineer, of New York; C. L. Howk and H. C. Currier, engineers, of Chicago.

The United States Electric Company, of New York, gave its exhibition in connection with that of the Western Electric Company, showing the most recent adaptations of the Gill selector to the telephone in train despatching. It consisted of an entire telephone selective apparatus for a despatcher's office and the associated station equipments. This outfit, which is the one now in actual use on the New York Central, Canadian Pacific, Lake Shore and Michigan Southern, and several other railroads, is so arranged that the despatcher can call automatically any station at will on the circuit and get an automatic answer back in seven seconds. A further exhibit was made of the Gill selector showing its adaptation to high speed multiple calling. This comprised twenty-four station equipments with a train despatcher's automatic calling device, consisting of a case containing twenty-four push buttons and an automatic signal call box to operate the same. The despatcher, when calling, first presses the buttons corresponding to the station or stations he wishes to call, the automatic signal is then set in motion and any or all stations desired are called by one operation. By this method any one of the stations can be called in from one to six seconds, and all of the twenty-four stations can be called in eighteen seconds. This method recommends itself particularly wherever it is desirable to call several stations together to issue train orders. This company was represented at the convention by Edwin R. Gill, the inventor of the Gill selectors; Harrison Osborne, secretary, and Howard E. Merrell, the general manager.

It will not be out of place to state in this connection that the Canadian Pacific Railway's telegraph have installed at every test office on their system a Gill telegraphic selector call. At Greenville Junction, Me., recently, where one of these instruments is installed, a couple of burglars attempted to loot the station, evidently knowing that $16,000 had been deposited there that day. They overpowered the night operator and proceeded to blow off the outer door of the safe with nitro-glycerine. In the meantime the despatcher at Brownville Junction, thirty-three miles away, had been steadily calling Greenville. Being unable to raise that office, he sent in the combination for the Gill selector, to which is attached a loud vibrating bell. This alarmed the burglars, who imagined it was some kind of a burglar alarm signal and immediately decamped without obtaining the $16,000, although two minutes more work would have secured it.

The exhibit of the Stromberg-Carlson Telephone Manufacturing Company, of Rochester, N. Y., presented a well-arranged operating display of their selective alarm telephone despatching system. The apparatus for a complete despatcher's office located on one side of the room was connected up as in regular practice with five complete equipments representing local stations as placed on a division of a railroad of any length. A feature that was not instantly appreciated by visitors unfamiliar with this equipment was that this system operated its selectors on a common battery circuit, requiring a pressure of only .15 of an ampere. The telephone instruments shown with this particular selective equipment were of the local battery type as recommended for this service This system embraces a telephone line and has superimposed on this line selective devices in a manner similar to the application of telegraph signals of the simplex type, provision being made for applying the signaling mechanism and operating the same without interference with the telephone conversations.

The Stromberg-Carlson Company was represented at the convention by H. C. Slemin, S. R. Wright, Charles E. Hague and E. C. Lewis.

The Sandwich Electric Company, of Sandwich, Ill., was represented by H. O. Rugh and J. A.

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Rugh. Their demonstration consisted of the well-known Sandwich telegraphone, with telephone train despatching equipment, operating in conjunction with the No. 2 Sandwich selector. The important feature of maintaining a means of communication during circuit failure was efficiently demonstrated and met with general approval.

Mr. J. J. Ghegan, president of J. H. Bunnell & Co., Inc., of New York, manufacturers of telegraph apparatus and appliances, dry batteries, etc., distributed a beautiful souvenir book of views of Montreal, which was very acceptable to the visitors and one which will be preserved as a memento of their trip to the Canadian metropolis. Mr. Ghegan expressed himself as delighted with his visit, which enabled him to renew many pleasant friendships as well as to acquire a number of new ones.

The Railroad Supply Company, of Chicago, was represented by Mr. E. W. Vogel, signal engineer. The company had a very interesting exhibit of the Chicago crossing signal. The exhibit shown by Mr. Vogel was a miniature signal, complete in all its details and equipped with a Chicago automatic cut-out, which makes it entirely practical to instal track-circuit crossing alarms at crossings adjacent to stations. By the use of this device the alarm will not ring unnecessarily and thus make a nuisance of itself when locals are standing on the track-circuit doing switching or other work. The company also exhibited its line of lightning arresters, styles A, B and C, which are of the choke-coil pattern and which are designed to be put in series with the instruments to be protected. These arresters are furnished with or without fuse. The fact that there are over 250,000 of these arresters in actual daily service on telegraph and railway signal lines proves their usefulness. The company also had on exhibition a new style of lightning arrester, which is termed the style F arrester. This arrester is entirely new in principle and embodies several advantageous features. Although small and compact the arrester presents between 700 and 800 sparking gaps to the ground terminal, which is made from a non-fusible material. The distance between the spark gaps and the non-fusible ground terminal is between 5/1000 and 8/1000", from which it will be seen that the arrester will break down at a voltage of between 700 and 1000. The ground centre being non-fusible prevents the usual trouble with lightning arresters of metallic parts fusing together when a lightning discharge takes place. The material of which the ground centre is made can be furnished in any desired resistance so that if for any reason a ground takes place, the resistance offered to the usual working currents will be high enough, so as not to interfere with their work. The arrester is so designed that all parts are in plain view and can be instantly taken apart for inspection without opening or grounding any lines. The arresters are mounted upon slate or porcelain bases, and as they are equipped for use with or without fuse, it is entirely practical to use same in series or in multiple.

Mr. C. K. Woodbridge, representing the Yetman Typewriter Transmitter Company of North Adams, Mass., was present and explained the merits of that transmitter. He demonstrated that every Morse signal sent on the wire could be recorded in typewriting and a permanent file of all telegraph work kept intact. Mr. E. E. Fitch, of Boston, an old railroad operator, used the combined machine typewriter and telegraph with its attachment for railroad work.

Mr. Richard D. Brixey, son of, and general manager for, W. R. Brixey, New York, manufacturer of the well-known Kerite wires, was present at the convention, accompanied by Percy W. Miller of his office. Mr. J. V. Watson, president of the Watson Insulated Wire Company, of Chicago, the Western representative of the Brixey concern, was also present.

Mr. George L. Foote, of Foote, Pierson and Company, New York, was an interested observer of the selector exhibits, the Hulit selector, manufactured by his firm, furnishing a conspicuous example of this style of instruments. He was glad to renew old acquaintances.

Mr. John Langan, of the Okonite Company, New York, manufacturer of the well-known wires, tape, etc., bearing that name, was in attendance at the convention, as is his habit.

The L. M. Ericsson Telephone Manufacturing Company, of Buffalo, N. Y., represented by L. M. and T. S. Hemenway, made an excellent display in their exhibit, which embraced a full line of the products of their manufacture.

Another exhibit was that of the Homer Roberts Telephone Company, of Chicago, in which the special features known as the "Roberts System," a development of that company, received attention.

Mr. Louis F. Wise, for several years manager of the Western Union telegraph office in the Chamber of Commerce, Minneapolis, Minn., has been promoted to the management of the main office in that city, vice J. E. McCann, resigned. Mr. W. J. Durand, who had a former residence in Minneapolis, but who for several years past was manager at Watertown, S. D., has been appointed manager of the Chamber of Commerce office to succeed Mr. Wise.

Reference was made a short time ago to the reckless cutting of an underground cable in England. A counterpart occurred at Oakland, Cal., recently, when an Italian ditch digger cut a main eastern telegraph cable at that place, for the time being largely impairing communication with the rest of the United States. The cable was incased in a lead pipe five inches in diameter, but to the workmen it might as well have been a log of wood. One of them took a good long swing with his pickax and instantly one hundred wires were cut.

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Despatching Trains by Telephone.*

BY W. W. RYDER,
Superintendent of Telegraph, Chicago, Burlington and Quincy Railroad.

The proposition of substituting the telephone for the telegraph in the handling of trains has in the past been the subject of much discussion.

The electric interurban roads early recognized the desirability of this means of communication for the purpose mentioned, and as the number and speed of their trains and the weight of equipment increased, necessitating a more exact method of despatching, they extended their use of the telephone until it is now recognized by them as the standard method of operation. The steam roads, however, with their ultra-conservatism, were loath to part with the long-established telegraph, and, while a little experimenting has been done from time to time in a very small way, it is only recently that the use of the telephone for this purpose has been attempted on a sufficiently large scale to secure a fair demonstration of its possibilities. The immediate incentive for these experiments was the near approach of the date for the enforcement of the Federal nine-hour law, coupled with the well-defined shortage of telegraph operators that had existed for two or three years.

The first experiment on the Chicago, Burlington and Quincy Railroad of handling trains exclusively by telephone was begun on December 11, 1907, on the portion of the main line between Aurora and Mendota, a distance of forty-six miles. Eleven offices were cut in on this circuit. The result was so satisfactory that the construction of another circuit from Aurora to Galesburg, one hundred and twenty-five miles, with sixteen offices, was immediately authorized to handle the despatching between Mendota and Galesburg. This circuit was completed January 24, 1908, and has been in use regularly since that date. On March 1, 1908, the third telephone circuit was completed. This extends from Clyde, the end of the Chicago terminals, to Aurora, a distance of twenty-eight miles, with fifteen offices. These three circuits are all on double track. On March 19, the first installation on single track was completed between Aurora and Savanna, a distance of one hundred and six miles, with twenty-three offices.

Up to this time, while many who personally investigated the matter were willing to concede its efficiency as applied to double track operation, they were very skeptical as to what would be the result on single track. In this distrust they overlooked the fact that in our method of double track operation, the irregularity of reverse movements in reality made the requirements on such lines more exacting than on single track, where opposing movements were perforce the regular method of operation. The results of this last installation were even more marked than on double track, and I am convinced that the handling of trains by telephone is not only much more satisfactory, but is really safer as well, and this opinion is shared by all who have personally looked into the matter.

Believing that the best was none too good for a train wire, we have in each case, with the exception of the Clyde-Aurora circuit, strung two 210-pound copper wires and have made the installation as complete and perfect as we know how. With the present market price of copper, the telephone circuit costs approximately $100 a mile and the station equipment about $50 per station. This is more expensive than the telegraph circuit, and the maintenance will be a little more difficult and the cost a little higher, but the results have proven so absolutely satisfactory, we feel the additional expense is fully warranted.

Our arrangement makes the circuit entirely self-contained, that is, the signaling and talking is all done on the same pair of wires. The signaling is done by semi-automatic selectors that enable the despatcher merely by the depression of a couple of buttons in connection with a series of synchronous clocks to ring at will vibrating bells in one or more offices on the circuit. This is a much less laborious method of calling, and we also find a very great saving in time, the operators responding very much more quickly than is the practice with the telegraph. In the local offices we put a four-inch vibrating bell, one large enough to be heard at a considerable distance, and when this bell lets go without any preliminary warning, the one thought of the operator is to shut it off and so he immediately answers the call. More often than otherwise the operators to avoid annoyance of the signal bell forestall the despatcher's call and report trains as soon as they pass.

In handling orders, the same general methods are observed as with the telegraph, any figures or names of stations occurring in the order being spelled out by letter, both in the giving of the order and all of the repetitions, and the name of the conductor on a "31" order is spelled out as well. The use of the telephone is so quick in every way, and so much more flexible, the despatcher is enabled to get far more detailed information of just exactly what each train is doing, even, when occasion requires, talking directly with the conductor or engineer personally, and is thus brought just so much nearer the actual details of train movement. Only a personal investigation of the scheme can show how valuable is this information.

There has also been a marked improvement in the working of the men on these telephone circuits due to the fact that the conversations between the despatcher and the operators or other employes are of a much more personal character than obtains with the telegraph, resulting in much closer co-operation. It is even possible to save considerable time in the actual putting

*Read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-27, 1908.

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out of orders. The despatcher copies the order in his order book as he talks it off, thus gauging, or rather reducing, his speed of conversation to his ability to write it down, as well as the ability of the operators to do so. Then when the operators repeat the order, they talk it off as fast as they can or much faster than is possible by telegraph.

The change in method in every case was made without a hitch and without any opposition worth mentioning. I had an idea that while possibly the despatchers themselves might not openly oppose the change, their support might be of a passive character, but in this I was agreeably disappointed. The first circuit had not been in operation a week before a little spirit of jealousy was evidenced, directed against the despatchers on the telephone circuit, it being so clearly evident they had the "snap" of the office. Soon all the despatchers in the Aurora office were desirous that we give them the same facilities, and, now that all have been taken care of, there is not one of the twelve that would willingly go back to the old method.

It is far easier to educate telephone operators than to secure telegraphers. There is hardly a town anywhere on the line in which there are not young fellows, who by reason of their frequently being around the depot, are more or less familiar with the railroad game, and who with a very little training would be perfectly competent to sit in as a telephone operator. There is much to be gained by making use of men in their own home towns, or who have grown up along the line. Our telegraph service was at its best when this condition existed to a considerable extent, and discipline has lessened in proportion, as we have been compelled to import telegraph talent.

This increased use of the telephone has also opened an avenue whereby we can offer better employment to those unfortunately injured in our service, few of whom in the past have been able to learn telegraphy. Another item worthy of consideration is the broadened field from which we can make despatchers. In the past, the first requisite for a despatcher was an ability to telegraph, and with the character and ability of telegraphers in general dropping as fast as it has during the past two or three years, we certainly can but expect difficulty in the future in getting satisfactory talent, even if this difficulty has not been greatly in evidence in the past. I maintain that a good, bright, young freight conductor, who has been actually carrying out the train orders, would make a better despatcher himself and be better able to assist in getting other trains over the road than is the telegraph despatcher, who, in spite of his occasional trips on freight trains, is a theorist after all.

The establishment of telephone circuits enables us to close unimportant offices wholly or a portion of the time, as a telephone instrument can be placed where the train conductors can readily get in touch with the despatcher, and report their trains into clear or get help if necessary.

Another important feature in the use of the telephone is the fact that it works even better in bad weather than in good—just the reverse of the telegraph—and if there is ever a time when good service is needed, it is when the weather is wet and foggy. There is no exasperating interference with the despatcher's efforts by reason of the relay in some way office being out of adjustment and the inattentive operator making no effort to see whether this is the case or not. The telephone is always in proper adjustment, and because of the lowered static capacity of the circuits, works as if charmed. With the telephone, it is possible to arrange apparatus, for instance, in the superintendent's office, so that he can at any time listen to the actual work of the despatchers and operators and thus check up any tendency to slackness. This has not always been possible in the past, as not all superintendents were telegraphers.

The improvement in the handling of train despatching by telephone has been so clearly demonstrated, we have decided to attempt to handle other messages in like manner and in a short time all business for the way offices on certain portions of our line (both main and branches) will be handled by telephone, this to include Western Union telegraph business as well. At junction points where branch telegraph lines are to be worked and at certain wire test offices, it may be necessary to maintain telegraph service, but at all other points all classes of business will be handled by telephone.

The field for substituting the telephone for the telegraph daily opens up before us almost faster than we can comprehend it, and the results we are obtaining from our experiments are a constant but very agreeable surprise. For instance, only a short time ago it seemed next to impossible to get satisfactory telephone service on single wire branch lines without completing the metallic circuit and this the volume of business did not warrant. However, latterly we have made successful substitution on two branch lines, one eighteen miles long with three offices, and the other forty-nine miles long with ten offices. These branch wires have been so arranged that while not connected permanently with the main line, they can be connected automatically at the will of the despatcher or the way office operator, the signaling on the branch being done by means of ordinary bridged bells.

The unqualified success of our experiments with the telephone as a substitute for the telegraph, and the rapidity with which other roads are extending the work, convinces me that the next few months will witness a great change in method of handling trains all over the country, one that will greatly benefit the service.

Roads using telephone for train despatching and mileage covered by this service, either in actual operation or authorized, are: Illinois Central, 2,536; Chicago, Burlington and Quincy, 746; Chicago and Northwestern, 478; Chicago, Rock

(Continued on page 456.)

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Western Representative
WATSON INSULATED WIRE CO.
Railway Exchange, Chicago, Ill.

NEW YORK

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(Continued from page 453.)

Island and Pacific, 333; Michigan Central, 259; Chicago, Milwaukee and St. Paul, 223; Great Northern, 202; Northern Pacific, 109; Baltimore and Ohio, 105; New York Central, 95; Lake Shore and Michigan Southern, 88; Delaware, Lackawanna and Western, 62; Wheeling and Lake Erie, 60; Canadian Pacific, 49; Pennsylvania Railroad (Lines East), 225; Lake Erie, Alliance and Wheeling, 104; a total of 5,674 miles.

The two latter are branch lines operated by bridged bells and hand generator signaling.

The Telegraph at the Chicago Convention.

Considerably more business was handled by the two telegraph companies at Chicago during the convention just closed than passed over the wires at the last convention at the same point and which resulted in the renomination of Theodore Roosevelt.

The Western Union Telegraph Company during the eight or nine days, inclusive of and preceding the days of the convention, took care of about 3,000,000 words of newspaper matter. That is to say, the newspapers of the country filed with the Western Union approximately 400,000 words of news about the convention every twenty-four hours.

The bulk of the business, of course, was mostly for the morning newspapers of the country and was placed on the wires between 8 and 12 o'clock at night, Chicago time.

The business of the Postal Telegraph-Cable Company during the same time averaged about 300,000 words a day. The two companies therefore passed over the wires about 5,500,000 words.

This was for the newspapers exclusively. It does not include private messages, market reports or press association material. Nor does it include either the regular news dispatches or the materials sent by The Associated Press over that concern's leased wires, which averages possibly 50,000 words every twenty-four hours.

As far as can be learned Thursday, June 18, was the busiest day of the convention period, for the telegraph companies. In the twenty-four hours ended at two o'clock Friday morning they probably handled nearly 1,000,000 words between them. The business on the other days had fluctuated considerably. The exact figures, if they could be obtained, would doubtless show some remarkable differences.

Practically all of the press matter that was sent out by the convention was despatched from the Auditorium and the Auditorium Annex, being conveyed by messenger boys to the main offices of the two telegraph companies.

Almost all the business was done in the United States, the despatches being sent direct to their destination.

New York newspapers got during the convention about 150,000 words a day

Of course, the handling of so much extra business entailed the employment of many extra operators and messenger boys. In the offices of both companies nearly all of the operators worked in double shifts. Notwithstanding the tremendous amount of business, the companies were able, it appears, to do even better when it came to a pinch.

The desirability of Chicago as a place for convention, according to the telegraph companies, is that it is so central, and that it eliminates from their calculations the second largest city in the country, which handles the convention as a local affair. At Denver the conditions will be much harder. Denver, being off the main line, has not the trunk lines that Chicago, St. Louis and Kansas City have. Then, too, many messages for points east of Chicago have to be relayed. Furthermore, the Chicago newspapers will have to be supplied, and as the volume of business that goes to them is very great, this is a very important consideration.

The Old Timers and Military Telegraphers.

The circular announcement of the twenty-seventh annual reunion of the Old Time Telegraphers' Association and the Society of the United States Military Telegraph Corps has made its appearance. The dates of the meeting will be September 16, 17 and 18, the point of assembling Niagara Falls, N. Y., at which place the Cataract-International Hotel will be the appointed headquarters. As has been stated previously, this coming reunion will be a fulfilment of the deferred plans by the same hold-over committees appointed for last year, postponed at that time because of the unsettled condition in telegraph circles owing to the strike.

A programme thus far prepared for the occasion provides for the holding of a business meeting of the United States Military Telegraph Corps at the hotel at ten o'clock on the morning of Wednesday, September 16, to be followed at one o'clock by a similar meeting of the Old Time Telegraphers. In the afternoon the noted power plant at this point will be inspected, and a visit made to the manufactory of the Natural Food Company, where a "demonstrative" lunch will be served. In the evening a reception will be held in the ballroom of the hotel. On Thursday morning, the 17th inst., the visitors will take a trip over the Niagara Gorge belt line, for which special cars will be provided. This trip will be supplemented in the afternoon by an automobile ride around Goat and Three Sister islands and through the State Reservation Park, while in the evening there will be a vaudeville entertainment and smoker in the court park of the International Hotel. The programme arranged for Friday, Septer 18, will be announced later.

The officers of the Old Time Telegraphers' and Historical Association are: H. D. Reynolds, president, Buffalo; George A. Burnett, vice-president, Buffalo; I. McMichael, vice-president, Toronto, Ont.; George F. Macdonald, vice-president, Ot-

(Continued on page 460)

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The Gill Selector

THE GILL SELECTOR
SIZE 6 X 3 1-2 X 3 1-2 INCHES

FOR

Train Despatching

The Gill Selectors may be attached to a telephone or telegraph circuit so that the despatcher may call any station or group of stations. A signal is automatically given to the despatcher when the station receives the call.

The operation is extremely rapid, requiring only a few seconds.

The Gill Selector is now used by many of the largest railroads in the United States and Canada and has proved absolutely reliable in actual service.

The installation and operation of the selectors does not prevent a high grade of telephonic transmission, nor interfere with regular telegraph service.

They have many advantages which allow them to be used even if the line is in trouble.

The instruments may be rented or purchased at very reasonable prices.

Write us for full information.

AUTOMATIC CALLING DEVICE FOR TRAIN DESPATCHERS' OFFICE
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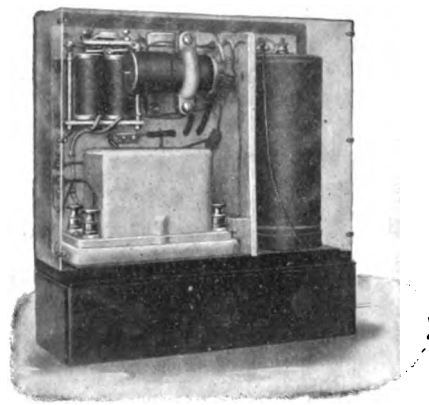

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United States Electric Company

95 William Street, New York

Sales Agents: WESTERN ELECTRIC CO., New York and Chicago

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Railway Composite System for Telephoning Over Telegraph Lines

To meet the demand of railway companies for a scheme whereby their existing telegraph lines may be used for telephone service, we have developed a complete line of apparatus.

Different methods are employed according to the service that is required. The railway composite system is very popular where it is desired to secure one telephone circuit for several stations from one grounded telegraph line. With this system the telephone apparatus may be added to the line without changing or rewiring the telegraph instruments. The apparatus is simple and gives splendid transmission.

Western Electric Quantity means Low First Cost

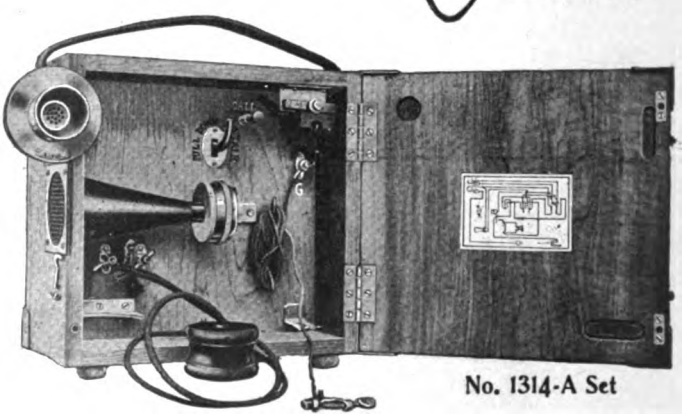
Western Electric Quality means Low Maintenance Cost

No. 1312-A Set

The No. 1312-A telephone set is for use at a permanent station.

The No. 1314-A telephone set is portable so that it may readily be carried on a train. Connection can be made with a composited telephone and telegraph line by means of the jointed pole and 100-foot cord, shown in the illustration.

Our **Bulletin T-206** gives complete information on the installation and maintenance of these telephones for railway service. This will gladly be sent free upon request.



No. 1314-A Set

WESTERN ELECTRIC COMPANY

EASTERN
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Manufacturers and Suppliers of all Apparatus and Equipment used in the Construction, Operation and Maintenance of Telephone Plants

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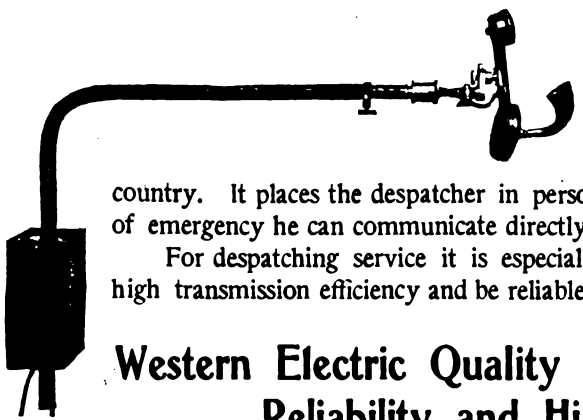
Train Despatching by Telephone Rapid and Accurate



FOR the handling of trains the telephone surpasses all other means of communication. It is no longer an experiment, but is now used by some of the largest railway systems in this country. It places the despatcher in personal touch with the operators at all times. In cases of emergency he can communicate directly with the train crew.

For despatching service it is especially important to select apparatus which will have a high transmission efficiency and be reliable under all conditions.

Western Electric Quality means Reliability and High Efficiency

The Transmitter Arm shown in the upper illustration is designed to meet the requirements of the men at the stations. The transmitter and receiver are adjustable and the arm is so arranged that it does not interfere with the vision and leaves both hands free while taking orders.

No. 234 Transmitter

The No. 234 Chest Transmitter in connection with the No. 128 Receiver is especially adapted for use by the despatcher. It enables him to move about freely while handling his train sheets.

No. 128 Receiver

We have a staff of engineers who are making a special study of telephone service for railway companies and we will gladly give you the benefit of their experience, and advise you of the apparatus best suited for your requirements.

WESTERN ELECTRIC COMPANY

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WRITE OUR NEAREST HOUSE

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(Continued from page 456)

tawa, Ont., and John Brant, secretary and treasurer, 195 Broadway, New York.

The officers of the United States Military Telegraph Corps are: Colonel William B. Wilson, president, Holmesburg, Philadelphia, Pa.; William L. Ives, vice-president, New York, and David Homer Bates, secretary and treasurer, 658 Broadway, New York.

In regard to the question of transportation, which in former years has been so generously extended by the railroads to the telegraphers, John Brant, secretary of the old timers, and who is also the chairman of the committee on transportation, says in his circular: "The operation of the Interstate Commerce law prohibits the issuance of free transportation by the railroad companies in the United States. Owing to the uncertainty of the railway situation nothing can be promised at this time regarding reduced rates. When definite information is obtained in this respect applicants will be notified."

New Western Union Office at Springfield, Mass.

The new office of the Western Union Telegraph Company, at Springfield, Mass., is a model in its way. Under the direction of John E. Jenkins, of New Haven, Conn., inspector of the district, there has been installed a new switchboard of three sections (150 straps), new repeater table with eight sets of repeaters; two new sextette tables; one octette table for operators; two new quads, one to New York and one to Boston. A mercury arc rectifier was also installed to operate the ten motor dynamos and at the same time charge a bank of storage battery for a reserve. It not being possible to get direct current at the new office location, a mercury arc rectifier of forty-ampere capacity was installed to change the alternating current to the proper direct voltage. The American District Telegraph Company has also installed a new equipment in its portion of the office with new up-to-date burglar alarm apparatus. The office is under the management of Mr. B. A. Cratsley. Mrs. Sackett is the chief operator. Mr. H. S. Finney, general foreman of the American District Telegraph Company, had charge of the installation of the work of that department.

Business Notice.

The Yetman Typewriter-Transmitter Company, of North Adams, Mass., is filling an order for twenty transmitting typewriter machines for telegraph use in England. These machines are additional to the twelve that the company supplied some time ago for governmental use, the eminently satisfactory working of which lead to the receipt of these orders. It would thus appear that the Yetman transmitter is steadily gaining in favor in Great Britain.

Radio-Telegraphy.

The first wireless telegram received from any of the steamships plying across the Pacific ocean came to the Victoria, B. C., station June 9, when the Japanese steamship Tango Maru reported from approximately three hundred miles off the coast of Vancouver Island on her way from Yokohama.

The English government has decided to ratify the Radio-Telegraph Convention. Germany has been notified of this adhesion of Great Britain, including all her dependencies except Newfoundland. The other countries which have to date notified adhesion are said to be Denmark, Norway, Roumania, Belgium, the Netherlands, Mexico and Sweden.

Communication between Mazatlan and San Jose del Cabo, Mexico, by means of wireless telegraphy, was set in working order at the beginning of the summer of 1907, when the installation of the lower California division was completed, the Mazatlan station having already been finished in the year 1906. The installation worked satisfactorily, although before it was accepted by the government from the contractors, the Gessellschaft fur drahtlose Telegraphie in Berlin (Telefunken system), the storm had wrecked both the iron towers in San Jose del Cabo. These towers have now been taken away and brought to Mazatlan and installed afresh.

The first annual convention of the Society of Wireless Telegraph Engineers was held June 1 at the residence of J. S. Stone, Boston Mass. This society was founded February 26, 1907, with charter officers as follows: J. S. Stone, president; Sewall Cabot, of Brookline, Mass., vice-president; C. K. Woodworth, of Brookline, Mass.; E. R. Cram and O. C. Ross, of Cambridge, Mass., managers; G. H. Clark, of Everett, secretary, and Dr. R. T. Wells of Somerville, treasurer. The election of officers for the ensuing year was attended with the following results: J. S. Stone, president; E. R. Cram, vice-president; E. A. Kolster, A. P. Browne and C. C. Kolster, of Boston and Cambridge, managers; C. E. Russell, of Somerville, secretary, and Dr. R. T. Wells, treasurer.

A correspondent writing to a foreign contemporary respecting the audibility of wireless telegraph messages which enables them to be read by outsiders, not necessarily from the sound of the spark, as has been held to be the reason, but because of the "brush discharge from the antennæ into the atmosphere," says further in discussing the subject: "I have noticed that in a 45-kw. station, where the spark was boxed up so that it was barely audible outside the room, the messages were easily readable at a distance of two miles from the station. At a distance of one mile the noise of the dots and dashes was much louder than just outside the spark room. While standing outside the station and directly under the antennæ, one would hardly notice the noise. Under certain atmospheric conditions at night the messages could be read by watching the glowing of the aerial wires each time they were charged by a dot or dash."

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But life and efficiency are two different things.

A Battery may last a year before the elements are exhausted and yet be unfit for the service expected in three months.

That is because the voltage falls off with use and because the batteries waste energy when not in use.

The Edison Primary Battery is so constructed that no current is wasted when the battery is idle and the taking of current through the external circuit does not reduce the voltage.

Its life is longer than any other battery of the same size and working under the same conditions and its voltage is steady and constant until the elements are entirely consumed.

If you are buying batteries for a serious purpose it pays to get the kind that will give reliable and uninterrupted service. You cannot get this from cells that waste current through local action or grow weak with use.

Edison cells are economical because they can be renewed when exhausted at small cost and because from first to last the same high, steady voltage is maintained.

There are Edison Batteries for all purposes. Write us your purpose and we will send complete information as to the type of cell you need, the number of cells and the cost.

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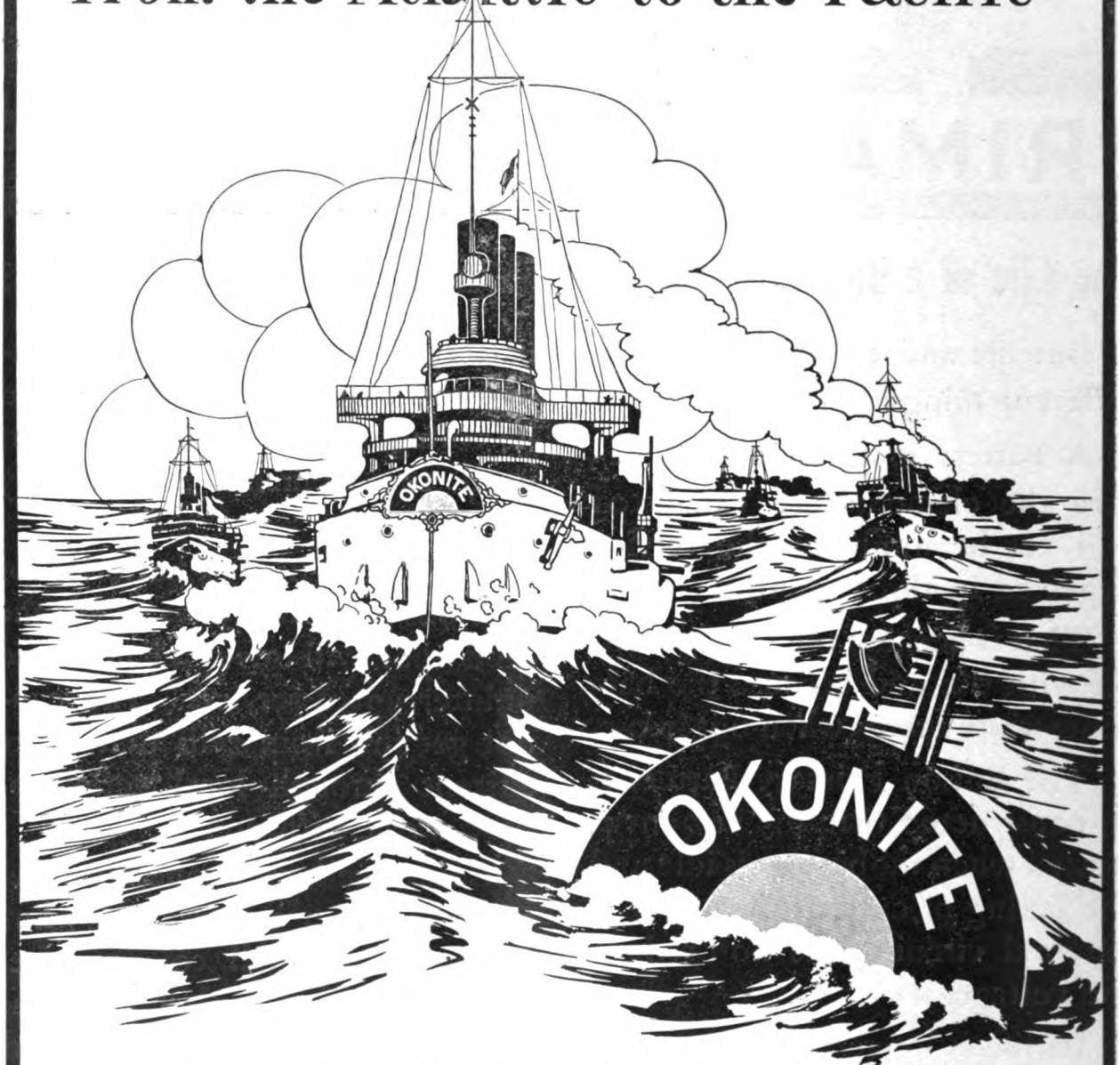

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Railway Telephony.*

BY W. E. HARKNESS,

Sales Engineer for the Western Electric Company, New York.

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* * * * *

At the present time there are approximately 20,000 telephones in use for various purposes by the railroads. In 1902 there were 7,544 telephone stations for the same purpose. This will give some idea as to the development of railway telephone service during the past six years, and from present indications it would seem that this development will continue at a more rapid rate for some years to come. An example of the rapid development of railway telephone service is shown by the Pennsylvania Lines (east of Pittsburg) which in 1893 had a total of sixteen switchboards and comparatively few telephones, and to-day has one hundred and fifty switchboards and over 10,000 telephone stations in service, and has contracted for over 900,000 trunk calls with the various telephone companies.

Railway telephone service may be divided broadly into three classes: First, business with the public; second, business between their own departments and stations; third, business with other railroads and transportation companies.

The service rendered the public is one of the most important, as it not only affects the business of the railroads, but also that of the operating company through which the connections are established, and, unless properly supervised and the quality of the service maintained, it will react upon the operating company and be a continual source of trouble and expense.

One of the first uses of the telephone by the railways was in the offices of the departments which came in contact with the public. Direct exchange lines were used for this service; and the office with more than one telephone was the exception. The service rendered under these conditions was extremely poor owing to the congestion of telephone traffic which naturally resulted. The effect of this condition was not appreciated by the railways, as they did not come in contact with the general public, who could not understand why these lines were continually reported busy.

From personal observation the writer has seen calls for lines to freight and passenger offices delayed from half an hour to an hour, owing to the number of calls which were placed for these lines. This not only caused complaint from the public, but placed an increased expense on the telephone company. In many cases records were kept by the telephone companies showing the seriousness of this condition and the effect it had upon the railway business, and with this evidence attempts were made to get the railways to provide additional facilities. This method in some cases was successful, while in others it was looked upon as simply an effort to secure additional revenue from the railways.

This state of affairs was largely due to the fact that there was no official who was responsible for the furnishing of adequate telephone service, each department head being the one who determined whether or not the additional facilities were necessary, and as a usual thing he did not know what actually was required nor did he consider it of very much importance. The introduction of the private branch exchange, however, placed the railway in a different position, as with this arrangement their private branch exchange operators were in direct touch with the public, received their complaints and observed the congestion on the various lines. The private branch exchange was usually placed under the superintendent of telegraph and in this way the responsibility of furnishing adequate facilities and first-class service were placed upon one particular department or official, who, owing to their other work, was particularly well adapted to handle the problem and realized the necessity of furnishing the highest grade of telephone service.

* * * * *

It is very apparent that the railroad mail service is necessary for the transmitting of written information and records which must be kept and need not be delivered with any great despatch, or if telegraphed or telephoned to their destination would cause unnecessary expense in both equipment and labor. The telegraph has been considered the only satisfactory method of sending information quickly and accurately between points on railroad systems.

The fact that a telegraph message is written by the sender and delivered in writing at the receiving point, thus giving a permanent record of the transaction, which could be used in case of differences arising in the future, is one of the reasons for the telegraph being used in place of the telephone in many cases, as it was believed by those using the telegraph that it would be impossible to transmit messages with the same degree of accuracy by telephone, owing to the similarity in the sound of some roads and letters when transmitted by telephone. At the present time, however, this belief is undergoing some radical changes. It is not to be taken, however, that the telephone will replace the telegraph entirely for railroad service, for there are many classes of messages which can be sent by telegraph with sufficient despatch and with greater economy than if sent by telephone, or even by mail.

There is a tendency on railroads to send messages by telegraph which in many cases could just as well go by mail, and in this way cause a congestion of telegraphic traffic and increase the cost of telegraphic service. It would appear that the classification of the inter-department communications on railroads has not received the attention which is due to a matter of such importance, but the indications are that greater attention will be paid to this matter as the use of the telephone becomes more general, and the economies which may be effected by its use in its proper place are realized.

* A paper read before the New York Telephone Society.

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The distribution of the inter-department communications correspond in many respects with the distribution of the toll and long distance messages in telephone service. The greater volume being between places close together while the remainder is distributed among points at considerable distances apart. The ratio between the short and long haul communications will differ on various roads due to the organization and length of the road, number of trains and the material transported, so that each road must be treated as a separate problem when the best method of communication is being determined.

The following will give some idea of the various classes of service connected with the operation of railroads to which the telephone is being applied and in which it has proven superior to the telegraph. One of the problems which confronts the railroad companies operating large terminals or stations is the prompt and safe handling of a large number of trains entering and leaving these stations. The writer thinks that all who live in the suburbs have had at times some rather unsatisfactory experiences in this connection.

One of the first to use the telephone for handling the traffic in its terminal was the Terminal Railway Association at St. Louis, Missouri. In 1895 this road erected a new depot at St. Louis with some twenty odd tracks running north and south, all of which must be available to trains from the east and west. Further, all trains entering the station must back in. This arrangement necessitated the focussing of all the tracks in the depot at one point from which a number of tracks curved east and west to meet the main lines. This arrangement, as will be seen, presented a very complex system of switch movements to permit a train coming from either the east or west being switched to any of the station tracks, and, with the handling of heavy traffic, offered many opportunities for mistakes and delays in the passage of trains at the common cross-over.

Considerable difficulty was experienced in the operation of this terminal until the telephone was adopted. The scheme of operation used is as follows: A train director is located in the interlocking switch tower which is just beyond the cross-over. From his desk he can see all of the tracks entering the depot and also the main lines from the east and west. He is in connection with telephone lines extending along the main line for several miles in either direction, and receives over these lines the reports of the movements of trains as they come into or leave the yards. These reports are made by switchmen located at various points throughout the yards, who control the switches on the main line tracks so that by giving them instructions the train director can shift the incoming or outgoing trains on the various main line tracks at will before they have reached or after they have left the terminal. He is also able to clear the station tracks for incoming trains in sufficient time to permit them to enter without delay. He is connected with the depot master's office so that he can notify him of the arrival of trains while they are still some distance from the depot and permit of the necessary shifting of the depot force to take care of them.

This connection also enables the depot master to stop any train leaving the station even after it has started as the train director can set the necessary stop signals before the train has left his control. The movement of all signals and switches in this terminal are under the control of the train director and are changed by the switchmen on his verbal instructions. In this manner over 700 trains a day were successfully handled.

The directing of trains at the other large terminals throughout the country are now being handled by telephone, the details of operation differing as the local conditions demand. By this method the movements are made with safety and despatch and a marked economy in the operation is effected.

Although the traffic in the terminals has been handled for years in a successful manner, it has not until recently been considered advisable by the officials of the larger systems to attempt to direct or despatch trains on the main line of a railroad by telephone in place of by telegraph. Before the introduction of the telegraph for railroad service the movement of trains was arranged according to a schedule. The roads, being single track, were provided with sidings at the various stations, and so arranged that trains running in opposite directions were scheduled to meet at certain points. The train reaching the meeting point first was expected to take the siding and wait the arrival of the train from the opposite direction. Owing to delays and accidents considerable time was lost by this method of operation. The story told about the introduction of the telegraph for this service is about as follows:

In 1850 a train on the Erie Railroad on board of which there happened to be an official of the road, arrived at its scheduled meeting point and was obliged to await the train from the opposite direction. As time passed and the other train did not appear, the official becoming impatient at the long delay, went to the telegraph office and wired the next station asking if the opposing train had passed. On receiving an answer that it had not, he wired the station agent to stop the train and have it wait until the arrival of the train from the opposite direction. He then asked the engineer to take the train to the next station, but found that he objected, as it was irregular and he had no faith in the means of obtaining the information, and not until he had commanded him to do so was the movement made. Upon arriving at the next station it was found that the opposing train had not yet appeared and the telegraph was again employed and the train moved as before.

This demonstration of the saving in time which could be effected by using the telegraph led to the system of rules and orders in connection with the despatching of trains by telegraph which is universally used to-day. This development has of course been gradual. At first conductors of

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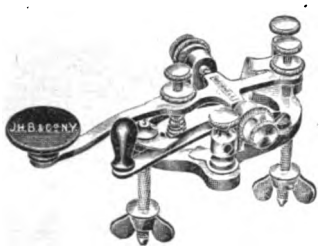

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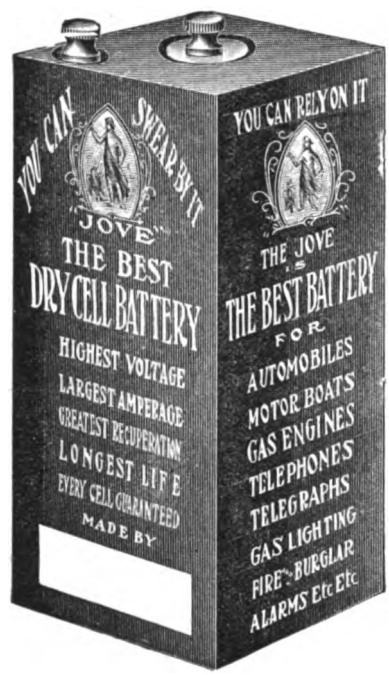

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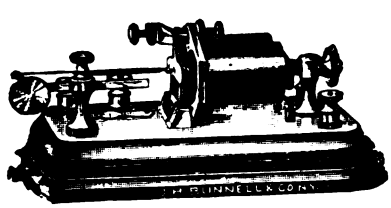

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Despatcher's Station. — The Master Station apparatus consists of a Magneto Portable Desk Telephone and Extension Bell Box—Master Selective Device or controlling switch—Recording Tape Device for designating calls repeated back from the station that has been signaled by the Master Selective Device.

Local Station.—The apparatus for any number of stations usually consists of a Magneto Wall Telephone—Local Station Selective Device. This device consists of a Selector and Trip Machine, which operates the call bell in the telephone and repeats station number back to Despatcher's office.

Last Station. — The 30th, 40th or 50th or Terminating Station in the railway division employs the same equipment as any other station, with the addition of a local terminal resistance.

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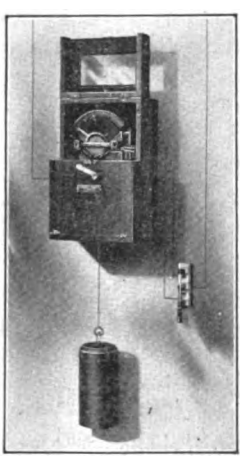

DESPATCHER'S MASTER DEVICE

THE OPERATION.

Speaking generally—the Train Despatcher desiring to communicate with a Local Station Operator at some point on his division, merely inserts a plug in the Master Station or controlling device at the Despatcher's Office and within a few seconds the Local Station Selector at the distant station, which he has selected, causes an alarm bell to operate. At the same instant the call is repeated back and registered at the Despatcher's Office. A general alarm, ringing every station at the same time, may also be provided.

The Local Station Operator, quickly responding to the alarm bell, removes the telephone receiver and is at once in direct talking communication with the Train Despatcher, receiving such orders or messages as the Train Despatcher may have to impart.

No signal system approaches the **Stromberg-Carlson Selective Alarm Telephone Despatching System** in positive results which produce safe operation—economical cost of installation and maintenance. **Central Energy** or **common battery** for operating the **Selectors** and **local battery** telephones for talking. No polarized relays—step by step mechanism—or delicate apparatus used. A system to do the work at the least maintenance expense. It is simpler than the Telegraph and combines numerous features that make it the most appropriate and reliable system invented.

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trains did their own despatching by sending messages to each other. Some roads in place of having regular despatchers left the issuing of orders to the superintendent or in his absence some other one person. What is known as the "single order" prevailed; by this is meant an order was issued to but one of the trains, directing it to await other trains at a certain point. This method occasionally led to "lap" orders being given to opposing trains and a wreck was the result. This trouble was overcome by the issuing of what is known as the "double order," which is the sending of the same order to each train concerned if possible at the same time. This method was universally adopted and is still being used.

The adoption by the various railways of a uniform system of rules, governing the movement of trains, has done much towards ensuring the safe and rapid handling of traffic. This system of rules was of course arranged to meet operating conditions and the transmission of the orders by telegraph. The use of the telephone for the same purpose is objected to on the score that it is not as accurate as the telegraph owing to the liability of misunderstanding due to the similarity of different words, letters and figures when transmitted by telephone. This objection, however, can be readily overcome, and, in fact, has been proven to be groundless, as is apparent when it is considered that the trains entering the large terminals have been successfully handled, and, further, that there are at present 213 roads operating nearly 18,000 miles of road which are using the telephone exclusively.

The Lake Erie, Alliance and Wheeling are operating their line of single track road for a distance of one hundred miles by telephone exclusively, and have been doing so for some years. This road handles a large coal traffic and their schedule covers thirty trains in each direction per day. There are twenty-four telephone stations along the line located at the various stations where orders may be given to the agent or train crews. All twenty-four stations are connected to the one telephone line and the signaling is accomplished by code ringing.

The low grade division of the Pennsylvania Lines between Columbia, Pa., and Parkesburg, that state, a distance of 38.4 miles, has been operated by telephone, supplemented by block signals, since August, 1906. The average number of trains handled daily on this section of the road is ninety-five and the average number of cars 4,800, transporting a total of 280,000 tons.

The arrangements for handling this traffic differs from those employed by the Lake Erie, Alliance and Wheeling. At each terminal of this division and at three intermediate points small cordless switchboards are located, to which are connected three classes of telephone circuits. One of these is called the "train director's wire," being a through circuit connected permanently into each of the five switchboards. Another circuit known as the "long distance emergency wire" connects the switchboard at each end station with the one at the center of the division only.

The switchboards are also connected by lines extending from switchboard to switchboard, and to these lines are connected some twenty-five telephone stations located in booths at various points along the track. These lines are known as the "block wires." The train director is located at one end of the division and by means of the train director's wire can get in touch with the operators at the various switchboards and through them be connected to telephone stations on the block wire in either direction, and in this way get in direct communication with the train crews.

In receiving train orders by telephone, conductors and enginemen are required to go to the telephone, one to receive and repeat the order while the other one writes it down. After it has been received the one who writes it from the other's repetition must repeat it back, while the one who received it must underline each word as it is repeated, in this way giving a check on the order and ensuring the correct understanding of the order by both parties concerned. Regular carbon backed printed forms are provided in each booth for the writing of the orders so that a uniform method is used and a sufficient number of copies made.

In case a conductor wishes to reach the operators or the train director at any point along the line he can do so by using one of the telephones connected to the block wire and if necessary can be connected to the train director by means of the train director's wire or the long distance emergency wire. In both of these cases the same rules and orders governing the movement of trains are used as would be used if the telegraph were employed as a means of communication, the only difference being that the telephone is used in place of the telegraph. It will be contended, and probably correctly in some cases, that these methods of operation, while capable of handling the traffic on roads of this class, will not meet the conditions existing on other roads. However, in the past year considerable attention has been given to this matter by railway officials throughout the country, and it has been found possible to use the telephone successfully in place of the telegraph on the main lines of some of the largest roads.

The first installation of this kind was that on the main line of the New York Central between Albany and Fonda, New York, a distance of about forty miles. This has been in operation since October, 1907, and it has never been necessary to resort to telegraph service during this time, even with the telephone circuit in trouble.

The line used is a metallic circuit of 210-pound copper wire and connection is established with sixteen stations along the section. Special signaling devices are used on this circuit which enables the despatcher, located at Albany, to call any one station without calling the others, or

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while talking to one station he may call another without interfering with the conversation. These selectors are operated by a relay of low impedance connected in series with the line, and are arranged to close a local bell circuit when operated by a combination of electrical impulses sent out over the circuit by the despatcher. The despatcher is furnished with a set of automatic calling keys, one for each station on the line, so arranged that the proper combination of impulses will be sent out over the line to operate the various selectors.

The selecting current, supplied by a grounded battery located at the despatcher's office, is applied to the neutral point of a bridged impedance coil and the current is completed to ground at the distant end of the line through another impedance coil similarly connected. In this way stations can be called while a conversation is being held on the line without interference from the signaling current impulses.

Further as has been demonstrated in practice, the stations on one side of the circuit may be signaled in case one side of the line should open and conversation can even be carried on with the stations with the line in this condition.

This illustrates one of the great advantages of the telephone over the telegraph, namely, that even though the line may be in trouble, conversation can be carried on over a line which if used for telegraph would be entirely out of service.

The selection of any station is done in about eight seconds and the local bell circuit closed by the selector remains closed until the operator answers the call by closing a key. The arrangements are such that the despatcher receives an automatic answer back signal from the station called. This signal is given by the bell at the station so that if the answer back is received by the despatcher there can be no question as to the ringing of the bell at the station.

The despatcher is equipped with a chest transmitter and a head telephone. The transmitter circuit is normally open and his receiver is bridged across the line at all times. In this way he can be reached instantaneously by any operator coming in on the line. A key for closing the transmitter circuit is provided and also one to connect a howler signaling circuit to the line. This latter being used when stations fail to disconnect their sets from the line after finishing their conversation.

The stations are equipped with special telephone sets consisting of a special desk arm to which is secured a special hand set, somewhat similar to the one used by telephone linemen, together with the usual induction coil and batteries. A key for closing the transmitter circuit is also provided. The special equipment was necessary owing to the fact that the operators in the stations were obliged to attend to the switches and signals and to do this properly should not be obliged to have to bother with a head telephone; further, by having the relative positions of the transmitter and receiver fixed, it was believed that better transmission would be obtained as the operator is obliged to hold his ear to the receiver to receive his orders, and when in this position he has the transmitter directly in front of him.

In issuing orders over this circuit the general rules governing the movement of trains previously given are followed. The despatcher calls the various stations desired by operating the automatic keys and as each man answers his call he is told to prepare to take an order. The order is then given by the despatcher word by word and written out by the operators. The despatcher writes the order word for word as he issues it to the operators and in this way prevents too rapid dictation and ensures the accuracy of his own record. It is then repeated back by each operator, and as each word is repeated back the despatcher underscores it in his book. The underscoring is done each time the order is repeated by the different operators so that if the order is issued to three operators and properly repeated by them, each word in the despatcher's book will be underscored three times.

It may be well at this point to state that the check on telegraphic train orders is usually done by an operator other than the despatcher who copies all the orders as given by the despatcher and repeated by each operator.

(To be continued.)

The World's Telegrams.

The Bureau International des Administrations Télégraphiques has just published telegraphic statistics for 1906, compiled from official documents, and some idea will be gained of the enormous volume of telegraphic business from the following figures, which cover all classes of telegrams, paid, free, inland and foreign.

Germany dealt with 52,490,981 telegrams; the Commonwealth of Australia and Tasmania, 14,454,114; Austria, 18,846,187; Belgium, 7,771,462; Bosnia, 708,253; Brazil, 1,723,871; Bulgaria, 1,496,062; Cape, 3,169,067; Portuguese Colonies, 264,951; Denmark, 2,803,341; Egypt, 5,934,239; Spain, 5,170,649; France and Algeria, 57,874,120; Great Britain and Ireland, 93,771,000; Greece, 1,540,775; Hungary, 10,017,452; British India and Indies, 24,912,336; Dutch Indies, 843,118; French Indo-China, 1,137,633; Iceland, 3,814; Italy, 15,812,569; Japan, 24,909,842; Luxemburg, 209,275; Natal, 700,312; Norway, 2,554,842; New Zealand, 6,603,497; Orange River Colony, 559,886; Holland, 6,333,205; Portugal, 3,758,554; Roumania, 3,309,358; Russia, 28,280,333; Senegal, 176,791; Servia, 722,889; Sweden, 3,602,568; Switzerland, 5,106,697; Tunis, 922,292; Turkey, 6,333,357; and the United States of America (Western Union Telegraph Company, 1905, and exclusive of the Postal Telegraph-Cable Company and the leased lines), 67,477,320. It will be seen that the above do not include the figures for all countries, but those quoted give a grand total of 482,307,012 telegrams.

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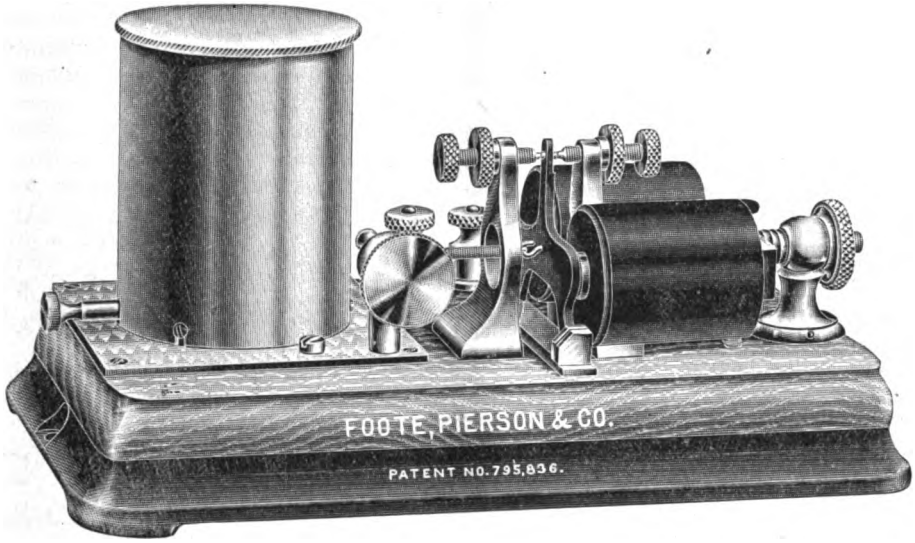
TYPE "B" SELECTOR

QUICK ACCURATE and RELIABLE CONNECTION Established with local circuit at any Station or Group of Stations Automatically.



The Multiple Transmitter Operates any Number of Selectors up to fifty.

Is Simple to Operate.

Turn the Pointer to Number wanted, pull down the Hook and let go.

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HAVE YOU SEEN OUR STYLE "F" ARRESTER

Positive Protection for Telegraph, Telephone and Signal Lines

HIGHWAY CROSSING ALARMS

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ASK FOR OUR CATALOGS

THE RAILROAD SUPPLY COMPANY

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Official Diagrams of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines

This volume contains 134 pages, including 105 full-page diagrams; size 7 x 4½ inches; price 50 cents.

Fourteen pages are devoted to rules governing the construction and repair of telegraph lines; and four to the subject of standard tools. Submarine cable splices, underground cable splices, single-wire joints and aerial cable splices are also fully treated. Under the general head of Rules for Wiring Offices and Cable Boxes, the subjects of the terminal office, intermediate offices, submarine and underground cables, aerial cables, call circuits and call boxes, leased wire offices, branch offices. miscellaneous. are fully given. Then come rules for the care of motors and generators, explanation of and rules for the care of the Callaud battery, rules for the care of the Leclanche battery and resistance coils, following which is the table of Size and Insulation of Wire Cable for interior use, and that of Wire Gauges.

The nominal price for so large, important and complete a work. embellished with so many first class plates, made especially for it, makes the book a valuable acquisition, indispensable to every telegraph and electrical student. The book contains diagrams of the Phantoplex system, the latest development in the telegraph art. All of the engravings are made from the official blue-prints of the Postal company, and are therefore absolutely correct, and have been produced under the direct supervision of John F. Skirrow, associate electrical engineer.

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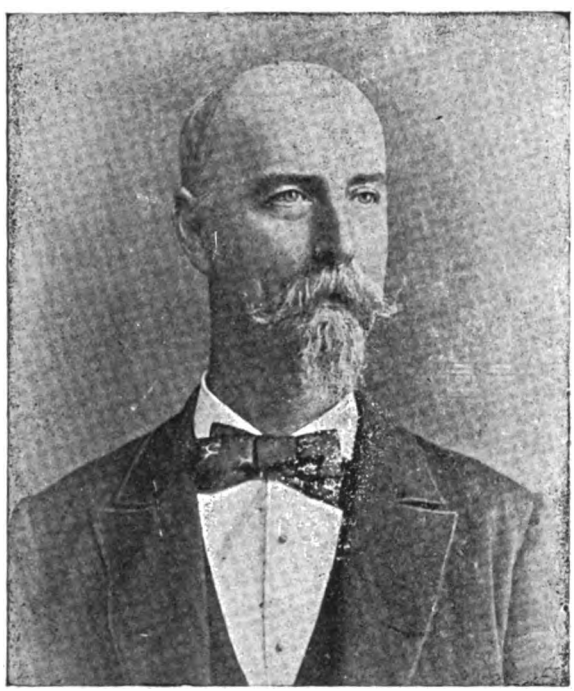
Death of William H. Young.

William Hamilton Young, night manager of the Western Union Telegraph Company at Washington, D. C., died suddenly at Chicago, on the morning of Friday, June 19. Mr. Young was in attendance at the Republican National Convention, going thither to look after the transmission of press matter sent by Washington correspondents to their respective papers. He became seriously affected by the heat, and this added to stomach trouble caused his death, which occurred at the residence of his son, Frank M. Young, on the morning following his attack.

The death of Mr. Young, familiarly, almost affectionately, known as "Ham" Young, removes one of the best known individualities in the telegraph service of this country. To the newspaper



WILLIAM H. YOUNG.
Late Night Manager, Western Union Telegraph Company, Washington, D. C.

correspondents of Washington his passing will be regarded as a personal loss, for in his capacity of having charge of the press gallery of his company in the capitol building during the sessions of Congress, a position he held continuously for many years, his relations with the press representatives of the country became intimate and cordial. His memory was a storehouse of reminiscent recall. It dated back to the period of the Civil War and to the years preceding that conflict, for he had been in telegraph harness in Washington since 1856, and correspondents found in him a never-failing supply of authentic material for many a good story. He was a prolific writer on the subject of the early history of the telegraph, its personnel, as well as that of the press. His contributions frequently appeared in Telegraph Age. In 1905-06 Mr. Young was president of the Old Time Telegraphers' and Historical Association, and when the annual meeting of that body was held in Washington in 1906, he furnished a most interesting reminiscent sketch as a contribution to the records of that body. It was published with illustrations in Telegraph Age September 16, 1907. Probably no one had a wider acquaintance among leading journalists than this veteran of the key.

Mr. Young was born in Washington, March 18, 1838, and had therefore reached his seventieth year. In 1854 he became a messenger in the local office of the Washington and New Orleans Telegraph Company. Acquiring the ability to telegraph, he became an operator and was given a position as such with the Magnetic Telegraph Company. With the exception of six months in 1856, when he was in charge of the office of the Baltimore and Ohio Telegraph Company, at Moundsville, W. Va., Mr. Young had resided in Washington. In 1861 he was appointed chief operator of the American Telegraph Company, and a portion of the time during the Civil War he acted as government censor.

In 1864 he was appointed assistant manager of the United States Telegraph Company, and in 1866 became manager of the Bankers and Brokers Telegraph Company. When that company was merged with the Western Union Telegraph Company in 1871, he accepted a position with the latter as assistant chief operator, shortly thereafter being promoted to be chief operator, subsequently being advanced to night manager, the position he held at the time of his death.

In 1882 Mr. Young became vice-president of the Telegraphers' Mutual Benefit Association of New York, his name never disappearing from that office in all the subsequent years. For more than forty years Mr. Young had been an active member of the Sons of Jonadab, a temperance organization, of which of late years he had been the sovereign secretary. He was noted for his temperance principles, although never a fanatic. His helpfulness to the unfortunate, to the outcast, to the drunken, will dwell long in the memory of many whose lives he rescued. It may truly be said of Mr. Young that he was a clean man, of upright character, an admirable type of the practical Christian gentleman. As a telegrapher he held high place, and his death is a distinct loss to the profession and to the company in whose service he was an honored employe.

Obituary Notes.

Albert L. Dunn, aged forty-three years, an operator employed by the Postal Telegraph-Cable Company, at Atlantic, Iowa, died at that place on May 31.

W. R. Hull, local secretary of the Commercial Telegraphers' Union at Memphis, Tenn., was drowned in the Mississippi river at that point on June 6. His home was in St. Louis, where he leaves a wife and two children.

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The Cable.

Cable communication is interrupted June 25, with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzorote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

To show the extent of the damage done to the cables by the trawlers off the west coast of Ireland, it is stated that one of the cable ships engaged in repairing cables recently found a cable damaged by a trawler for some two hundred and fifty fathoms; the cable was flattened and strained and the core opened out in places. Two pieces of trawlers' net were found on the cable.

The Spanish government has called for tenders for the construction and installation of a submarine telegraph cable from Cadiz to Teneriffe, thence to Grand Canary, Palmas and Gomera, from the latter island to Hierro, from Grand Canary to Puerteventura and thence to Lanzorote. The cost, not to exceed 5,000,000 pesetas (over $850,000), is to be distributed over two years. The present cable, laid many years ago, is practically worn out.

The Trawlers and the Cables.

In the English House of Commons the question of breakage of the Atlantic cables off the west coast of Ireland by steam trawlers came up lately for discussion. It was said by Winston Churchill that representations received from bankers, brokers, merchants and shipowners to the effect that there had been damage to submarine cables off the west coast of Ireland, and the Secretary of State for Foreign Affairs informed him that he had received a similar representation from the American Ambassador. He understood that the subject had also been brought before the notice of the Postmaster-General by the companies concerned, and the question had been raised at the International Telegraph Conference. He could not say whether the damage, which took place some fifty miles from the coast, had been caused by the operations of steam trawlers, but he was making inquiries, and was considering, in consultation with the Postmaster-General, whether any steps could be taken under the International Telegraph Conference and the Submarine Telegraph Act, or otherwise, for the protection of the cables, assuming the trawlers to be in fault. He understood that one of the companies concerned had recently substituted a heavier type of cable in the area affected with good results. There were obvious objections to showing the routes of those cables on the admiralty charts, but the government would take whatever steps might be possible to safeguard the commercial interests of the community in regard to this matter.

It is claimed that there have been twenty-seven breakages in Atlantic cables due to trawlers. George G. Ward, vice-president and general manager of the Commercial Cable Company, has a mass of split cable inextricably interwoven with fishermen's netting which he intends to send as evidence to the British foreign office.

There is some feeling, remarks an English journal, that the British cable companies have suffered in the past from lack of sympathy from British government departments in this connection, and it is considered, therefore, that the matter having become international in character, American interests being involved, it will now be taken up in a more energetic manner, possibly, conforming to a suggestion made, we believe, some time ago to the English government, that a naval vessel should be stationed somewhere off the Irish coast to protect the Atlantic cable zone, it being pointed out that the companies owning the cables have no prescriptive right to interfere with fishing operations in that zone. Of recent years submarine cables have been subject to serious damage from the heavy steam trawls and trawling gear which mark the development of deep sea fishing. This gear is capable of lifting immense weights and of operating down to eight hundred fathoms. Impact with this gearing, no matter how heavy the type of cable may be, results in serious injury, and it is said that the Anglo-American Telegraph Company has during the past two years spent no less than $400,000 in repairs and renewals to cables in this particular area. The fishermen themselves will, it is thought, welcome regulation, as they are also sufferers in that their nets are frequently damaged while operating in waters where the cables are situated. It is agreed, too, we believe, that the waters off the Irish coast where the trouble is now centered are not essential to fishing operations. Apart altogether from the money value at stake, there is high political necessity for international protection.

International Telegraph Conference.

An important feature in the proceedings of the International Telegraph Conference, at Lisbon, was reached on June 5, when the question of the pronounceability of code words was dealt with. A stipulation was inserted to the effect that codes should be submitted to the telegraphic administrations for approval. A board of control, consisting of British, French and German representatives, will be appointed to deal with such codes. Mr. H. Babington Smith, of England, has pointed out that codes not presented for approval, as well as those not approved, will nevertheless remain in force, but each administration will have the right to refuse words contained in them. Thus existing codes will not be interfered with, but it is anticipated that they will gradually be revised. Press telegrams may in future be written in the language of the journal to which they are addressed. Slight reductions have been effected in the terminal and transit rates, and the rules formulated by the Radio-Telegraphic Convention

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affecting a land transit of telegrams from or to ships have been embodied in articles.

Those in attendance at the International Telegraph Conference at Lisbon found time, it appears, to accept many social courtesies. A programme for such entertainment had been prepared in advance, inclusive of numerous dates from May 4, when the Conference assembled, to June 13, its date of closing, a series of brilliant and most delightful functions being listed. These included receptions, one of which was given by the king; dinners, excursions to various nearby points of interest and a bullfight. On the evening of the last day of the Conference a dinner to the delegates was tendered by the Councillor Director-General of Posts and Telegraphs.

Municipal Electricians.

Patent No. 453,082, for a fire alarm telegraph, held by G. F. Milliken, of Boston, has expired.

The International Association of Municipal Electricians will hold its thirteenth annual convention at Detroit, Mich., on August 19, 20 and 21. At this meeting the following papers will be presented: "Combination Cables for Fire and Police Signal Systems;" "Moving Picture Hazard;" "Batteries for Signaling Systems;" "Testing for and Locating Faults in Electrical Transmission Lines;" "Electrical Equipment of a Fire Station;" "Modern Police Signal System."

Morse Electric Club Outing.

The outing of the Morse Electric Club, as previously announced, will be held at Cove Hotel, New Brighton, Staten Island, July 18. The cable tug "Western Union" has been placed at the disposal of the club through the courtesy of Colonel Clowry, to convey the members to and from the grounds. Numerous games will be indulged in, and an enjoyable time is expected. The entertainment committee are arranging for the comfort and enjoyment of the members. J. B. Van Every is president of the club, F. J. Scherrer, secretary, and R. J. Murphy, treasurer.

Train Despatchers' Convention.

The American Train Despatchers' Association met in annual convention at Fort Worth on June 16. By reason of delay in arriving, occasioned by wash-outs, President Mullinix and Vice-president Carl Mitchell did not reach Fort Worth until the second day of the meeting, F. X. Myers serving meantime as president pro tem. Six new candidates were elected to membership. The discussion on the third day of the convention was devoted almost entirely to questions concerning the present method of operating trains of the country under the block system, train register advantages, disadvantages and frequent wrecks, caused by improper entries by conductors, operators etc. The discussion on the train rules committee's report, which was begun at the Wednesday session, was continued and disposed of.

NEW YORK WESTERN UNION.

The vacation season is now well advanced. Among those absent at this time are T. A. McCammon, chief operator; F. D. Giles, assistant chief operator, and A. M. Lewis, eastern traffic chief.

T. M. B. A. Assessment.

Assessment No. 480 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of Patrick H. Hughes, at Baltimore, Md.; Martin B. Hills, at Jersey, City, N. J.; William J. Murphy, at Cincinnati, O.; Luther Ruthraff, at Milton, Pa., and Albert L. Dunn, at Atlantic, Ia.

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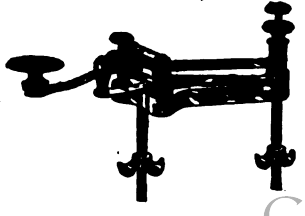

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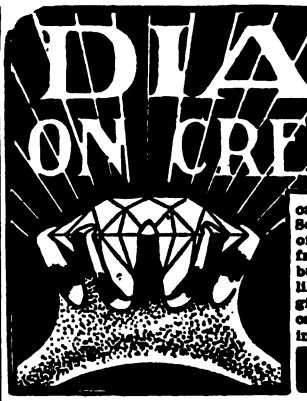

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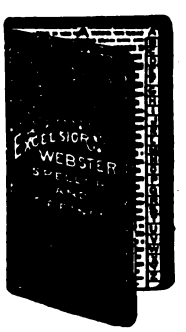

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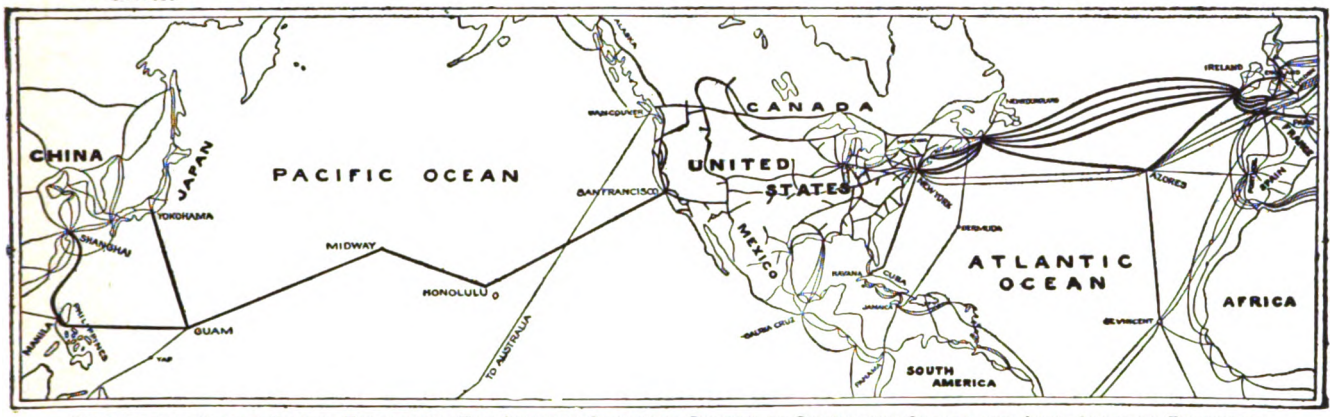

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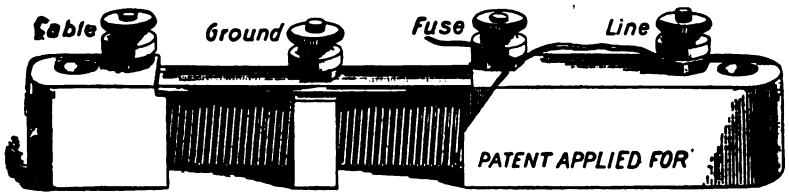

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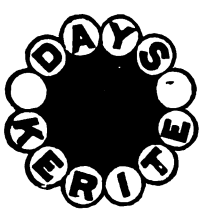

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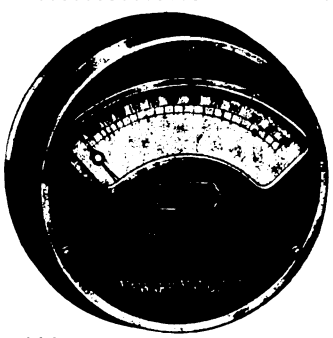

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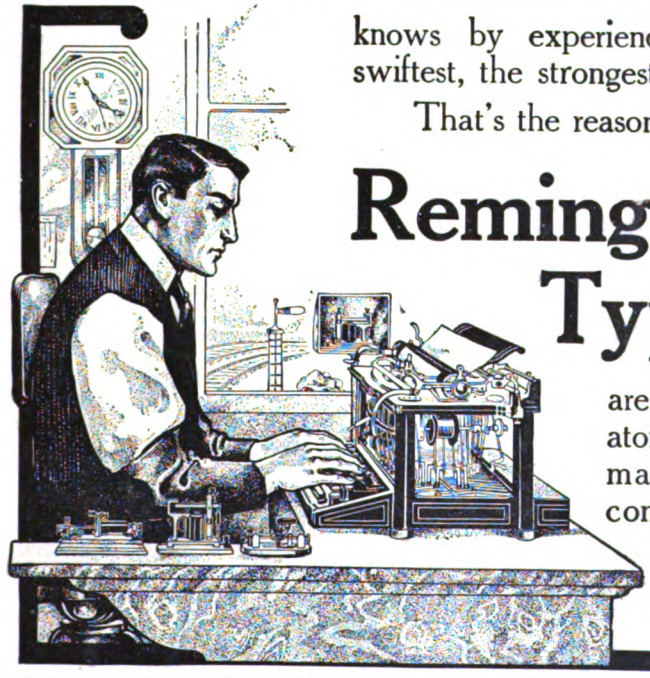

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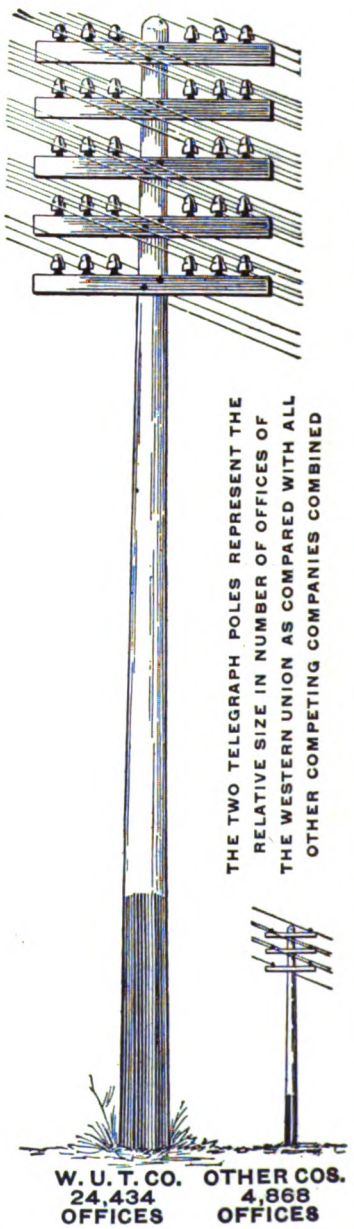

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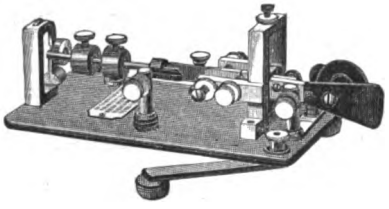

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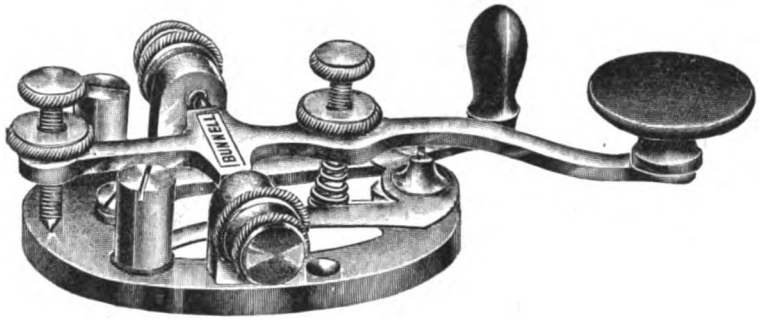

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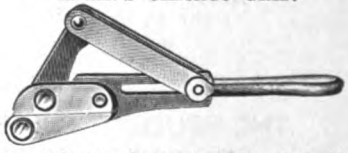

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SOME POINTS ON ELECTRICITY.

A Few Simple Rules to Follow.
(Continued)

BY WILLIS H. JONES.

Not only is it required that one should display something more than mere guesswork in the performance of even such simple tasks, for example, as the insertion of wires in binding posts, and straightening bent switch levers, as described in the preceding installment of this article, but one should understand the construction of all the apparatus he uses sufficiently well to minimize the chances of endangering the same through ignorance in handling.

LAMP SOCKETS.

For example, nearly every one who possesses but a limited knowledge of the construction of an ordinary lamp socket of the old standard wood-brass pattern, still used in many offices where the later standard porcelain type has not as yet been installed, makes the common but natural mistake, when inserting a new lamp, of twisting the latter as hard against the bottom connection as possible with the idea of making a firm and lasting contact between the outer and inner connections.

If the reader will glance at A in Figure 1 and observe the delicate manner in which the bottom and the inner shell are connected together, a further reason for guarding against undue pressure will hardly be required.

It will be seen that the inner cylinder-shaped brass into which the lamp is screwed is joined to the outer binding post by means of a small wire soldered to each. The cylinder, of course, fits snugly in the wooden holder, especially when new, but in time the wood shrinks and does not hold so well as originally. It is obvious, therefore, after the lamp has touched the solid bottom connection any undue pressure in the way of extra twists will cause the cylinder itself to turn around and thus tend to break off the wire or loosen the soldering. Hence when inserting a new lamp in an old socket, or even a new one, the best plan is to merely see that the connection is firm and not to use any unnecessary force in urging it further.

REPAIRING FLEXIBLE CORDS.

Another thing that should be more generally

A

FIGURE I.

understood is the proper way to mend defective flexible cords. This knowledge is especially beneficial to those in charge of branch and small offices, where linemen are not stationed and repairs must consequently await the latter's convenience.

Now, while the operation itself is apparently simple a novice usually makes a bungle of the job in the very last of the proceedings, namely, in the manner in which he winds on the twine wrapping and fastens the last turn so as to avoid unravelling. This should be done in such a manner that a knot will not be required and thus create a lump or uneven finish. B in Figure 2 shows how this can be accomplished. It will be seen that when the wedge has been wrapped to within about one-half of an inch or less of the finish the twine is then looped and one side of the loop is then wound over the other until the final turn is reached, after which the loop is pulled down or through by means of the free end until

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nothing remains of the protruding loop or wrapping twine, and the end clipped off. In this way the wrapping, which, by the way, should be wound on very tight, holds the terminal of the last turn securely. It will also be seen that the terminal string is placed on the narrow instead of the flat face of the wedge in order that the very slight ridge it makes will not be in the way.

C, in Figure 2, shows the first part of the operation. The twine wrapping and holding tape should first be removed, after which the two strands or conductors can be pulled out of the wedge. Then with a sharp knife remove enough of the green cord covering to get fresh conductor material, and after scraping the tinsel lightly reinsert the two wires in the proper place in the wedge, as shown in B, after which the ends may be trimmed to the proper length, taped, and rewound with the final wrapping as described. In case of cords used for duplex local circuits care must be exercised in order to avoid reversing the sending and receiving sides respectively. In the Western Union system it will be found that the cord terminals have different colors, one green and the other red. So all that is necessary to avoid confusion is to observe which side the two

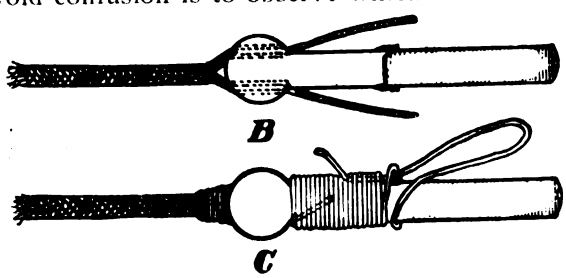

FIGURE 2.

colors are normally arranged and then replace them in the same order.

TEMPORARY REMEDY.

As a rule when all the tinseled threads which compose the two strands of the flexible cord conductors are not actually broken the periodical opening of the circuit due to jarring or moving the cord may be avoided temporarily by giving the cord several twists at the wedge end. This method presses the loose tinsel strands closely together and thus creates a continuity of contact which is not so easily broken.

Of course, this suggestion is merely for the purpose of providing an emergency remedy and is in no way a cure for the evil.

Recent Telegraph Patents.

A patent, No. 888,098, for an automatic phototelegraph, has been granted to Arthur Korn, of Munich, Germany. Selenium cell apparatus having detail features.

A patent, No. 890,661, for telegraphy, has been granted to Isidor Kitsee, of Philadelphia. A series of transmitting and receiving devices are connected each at a different point to an all-metallic line, the receiving devices being connected in parallel with the interposition of condensers to the line, and the transmitting devices embracing sources of current and a transmitting key and means to insert the sources in series to the line.

A patent, No. 890,911, for printing telegraphy, has been issued to Isidor Kitsee, of Philadelphia. The method of actuating a printing device at a receiving station of a submarine telegraph station, which consists in selecting through impulses of like duration and intensity following each other in unequal succession, the required printing type, and causing the receiving mechanism to return to its normal position by an additional impulse.

A patent, No. 892,319, for a binding post, has been awarded to Nicholas Sohl, of New York. A binding post making use of a U-shaped spring clip with laterally extending lugs having perforations to receive a conductor which is engaged by the outer prong of the clip.

The following patents have expired:

Patent No. 454,884, for a printing-telegraph instrument, held by F. Sedgwick, of Chicago, Ill.

Patent No. 455,075, for a printing telegraph, held by H. van Hoevenbergh, of New York.

Personal.

Mr. S. F. Jones, formerly assistant electrical engineer of the Postal Telegraph-Cable Company, is now filling the position of lighting engineer of the lighting and cable department of the Hudson and Manhattan Railroad Company, New York.

The numerous telegraph friends of James Kempster, the well-known printer of this city, were shocked and grieved to learn of the death of his daughter, Louise E., the wife of Theodore W. Mathews, which occurred suddenly on July 8.

Mr. James Kent, manager, and William J. Camp, electrical engineer of the Canadian Pacific Railway Company's Telegraphs at Montreal, Que., have gone west on a tour of inspection covering the lines of that system, their journey to extend as far as the Pacific Coast.

Mr. R. W. Ledwith, of 155 Washington street, Chicago, an old-time telegrapher and well known newspaper man, has entered the field as a newspaper correspondent and announces facilities possessed by him to furnish news specials by wire, news letters by mail, and ability to obtain interviews, of which he will furnish stenographic reports if desired.

Mr. Joseph P. Church, an old-time commercial telegrapher, for many years identified with the Western Union service at Toledo, O., but for the past twelve years chief clerk in the office of G. C. Kinsman, superintendent of telegraph of the Wabash railroad system at Decatur, Ill., was a recent New York visitor. Mrs. Church accompanied her husband.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Continued.)

THE PERFORATOR—CONTINUED.

Referring to the punch levers (10, Fig. 9*), their adjustment should bring into action only such punches as those to be selected (all others being entirely cleared or passed over in the operation), such adjustment being generally secured by increasing or diminishing the length of the connecting links.

The feed levers should be adjusted so as to allow the feed bail (27, Fig. 11) to pass or clear all levers (except the one selected) by an interval of about 1/32 inch. The movement of the feed bail with its graduated steps should be so regulated that the pins of the feed wheel will be carried up to the plate (55) directly above them when the feed lever roller (54) is on the high spot of the feed cam (24). Should the flat curved spring (56) be compressed after the pins strike the plate, the bail steps should be regraduated.

After the punch bars have been carried downward by the depression of a key lever they come into contact with a universal crossbar (5, Figs. 7 and 8), having on one end an adjustable fork (6) which operates a second universal bar (7). The latter releases a clutch (21, Fig. 7) by means of a hook lever (14, Fig. 12) which in turn disengages and locks automatically the clutch lever (16) through the medium of the small upright lever (15). The adjustment of the fork on the end of the first universal bar should be such as to prevent any possible action until the selected punch levers are down low enough to ensure their catching the punches to be operated. There should be about 1/64 inch play between the point of the hook attached to the second universal bar, and the small upright releasing and locking lever. The same amount of play should be allowed between the latter and the clutch lever when the small roller (46, Fig. 12) is on the high part of the cam ring (38) which encircles the rigid part of the clutch. When this roller is opposite the low spot on the cam ring, and the clutch is released, there should be enough play in the clutch lever to allow the tit (51) on the movable member of the clutch to pass freely.

The clutch is composed of three members mounted on a shaft (23, Fig. 11) carrying the feed and punch cams (24, 25). One member of the clutch revolves continuously, being held in position lengthwise of the shaft by a pin and a collar; the second member revolves longitudinally on the shaft, and when released carries with it by means of a fork the third member which is fastened rigidly to the shaft. On the periphery of the second clutch member is a tit, which prior to the depression of a key lever, holds the cam shaft in a stationary position, but releases it after the depression, the tit being also utilized to disengage from the first member (51, Fig. 15) by means of a small fixed cam (22, Fig. 16) when one revolution of the cam shaft is nearly completed. It is highly important that the clutch, punch cam, and feed cam, be set or adjusted on the shaft in proper relation to each other. The clutch is pinned to the shaft and is therefore not adjustable, but the cams are held in position by means of set screws. The feed cam should be so set that when the feed lever roller is on the low spot there should be about 1/64 inch between the tit (51, Fig. 12) of clutch and the socket of clutch lever.

The punch cam is so constructed and set that it will operate the punch bail immediately after the clutch is released, the high spot in the cam being very short, to enable the punches to clear the tape immediately after the work of perforation has been duly performed.

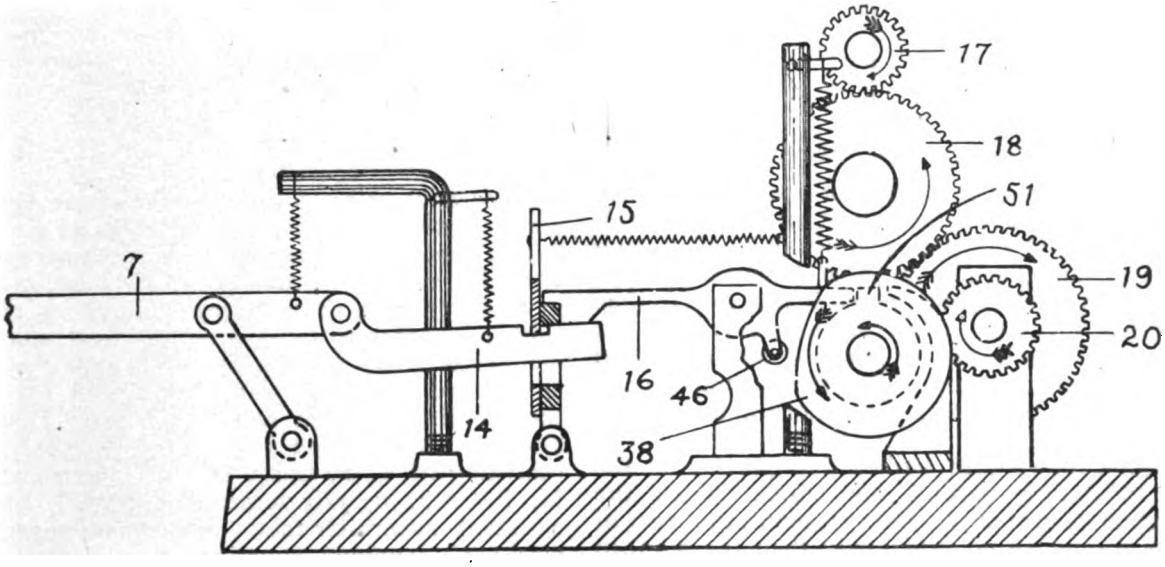

FIGURE 12.—MOTOR GEARING AND CLUTCH MECHANISM.

* Figures 7, 8, 9, 10 and 11 referred to in this installment, appeared in the July 1 issue.

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The construction and adjustment of the feed cam is of such character as to allow the feed bail (27, Fig. 11) and knockdown arm (33, Figs. 7, 10 and 11) to be actuated immediately after the clutch is released, the high spot of the cam being of sufficient length to give the punches time to clear the slip before feeding of the same takes place.

The knockdown arm is made in two parts, one a rod to which is fastend a horizontal lever, and the other a containing tube (57, Fig. 11) through which the rod passes. When the clutch is released the knockdown arm is raised up and pulled by

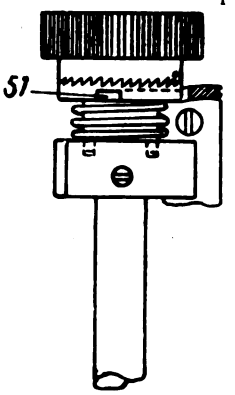

FIGURE 15—CLUTCH.

a spiral spring over the top of the feed pin now resting against its limiting stop (59, Fig. 11). After the feed cam has completed its revolution the knockdown arm is impelled downward, carrying with it the pin over which it was raised, thus enabling the feed wheel to turn until the pin selected by the last letter punched is brought into contact with the stop. This stop should be adjusted so as to cover a little more than half the diameter of the feed pin, as the lever attached to the knockdown arm strikes that portion of the pin extending beyond the stop. When the knockdown arm is at its lowest point, the lever of same should be slightly lower than the stop, to ensure the feed pins being driven low enough to

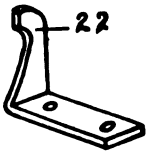

FIGURE 16—FIXED CAM.

permit free movement of the feed wheel. There is an adjustable spring (58, Fig. 11) on the knockdown arm which serves two purposes; it represents the power which knocks the pins down, and also assists in bridging over the moment of no contact at the teeth of the clutch, when the latter is released by its tit coming into contact with the clutch release cam.

(To be continued.)

Those who contemplate subscribing for TELEGRAPH AGE, and who would first like to inspect a sample copy, should not fail to write for the same.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. John F. Wallick, superintendent at Indianapolis, Ind., accompanied by his wife, was a recent New York visitor. Mr. Wallick is the dean of the corps of Western Union superintendents, having held his present position since January 1, 1864.

Mr. C. B. Dunham, manager of the Western Union cable station at Canso, N. S., was another recent visitor at this office, coming to New York on the cable steamer Mexican, after having been engaged in superintending repairs to one of the cables near Canso.

Mr. William Finn, of the electrical engineer's office, whose health has not been of the best of late, was a passenger on the steamer Mexican on both her outward and return voyages, deriving much benefit from the trip and the life on board during the period necessary for the cable repair.

Miss C. A. Van Brunt, attached to the office of Geo. H. Fearons, general attorney of the company, has gone to Europe, making one of a party of four, and will probably be absent two months.

Mr. John Simmonds, assistant city superintendent, and L. Wingate, of the World office, attended the Democratic convention at Denver in order to look after the interests of the New York city newspaper correspondents.

Some days prior to the opening of the Democratic National Convention at Denver, L. McKisick, assistant general superintendent, and J. J. Welch, assistant traffic chief, of Chicago, were in attendance at the convention building, going thither in order to look after the final arrangements necessary for the proper handling of the anticipated enormous traffic. On July 1 a further contingent went from Chicago to Denver, also in behalf of the same interests, the party consisting of T. P. Cook, general superintendent; M. T. Cook, his private secretary; W. J. Lloyd, assistant superintendent. Accompanying them was J. G. Jennings, superintendent of telegraph of the Chicago, Rock Island and Pacific Railway. The Chicago office also sent an assistant force to Denver of about sixty operators.

The annual meeting of the American Union Telegraph Company, of New Jersey, was held at 76 Montgomery street, Jersey City, N. J., on July 8. An election of officers was had which resulted as follows: Robert C. Clowry, president; Thomas F. Clark, vice-president; A. R. Brewer, secretary, and M. T. Wilbur, treasurer. Directors, R. C. Clowry, B. Brooks, Thos. F. Clark, J. B. Van Every and J. B. Bertholf. Judges of election were: C. W. Conklin, Frank E. Coyle and George Roehm.

Mr. Gifford Presents a Park.

New England seems to be held in special reverence and love by many of its sons and descendants, who turn with feelings of peculiar attachment to their ancestral home. An instance of devotion to this sentiment is witnessed in the

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action of Sidney Brooks Gifford, of Syracuse, N. Y., former superintendent at that point of the Western Union Telegraph Company. He has presented to the town of Harwich, Mass., a plot of seventeen acres, which included the site of the home of Mr. Gifford's father and many preceding generations of the Brooks family, of which Mr. Gifford is a descendant, it having been in the possession of his family for one hundred and fifty years. The town desired to acquire this property, but with generous public spirit, evincing a deep-seated love for old associations, Mr. Gifford refused to sell and instead donated the property to the town. It will be devoted to public uses and will be known as Brooks Park, thus worthily perpetuating the Brooks name in a community where its living personnel was once held in such honored esteem.

Louis F. Wise, Western Union Manager at Minneapolis.

Louis F. Wise, who has been appointed manager of the Western Union Telegraph Company at Minneapolis, Minn., mention of which was made in Telegraph Age July 1, elevates to that position a telegrapher of fine talents. He was born in the twin city of St. Paul, February 26, 1862, and gained his first telegraphic experience with the Northwestern Telegraph Company in that place, subsequently being taken into the employ there of the Western Union Telegraph Company, when that concern absorbed the former. In 1880 he entered the employ of the Mutual Union Telegraph Company at Chicago, but when that company in turn was also merged with the Western Union in 1884, Mr. Wise returned to St. Paul, once again entering the Western Union service. Faithful and attentive to duty, from the position of operator he was promoted in 1893 to be traffic chief. For nine years he discharged the duties of that place with credit to himself and to the satisfaction of his company. His reward came when in November, 1902, he was appointed manager of the Chamber of Commerce office in the neighboring city of Minneapolis. Because of peculiar fitness Mr. Wise was the logical successor to J. E. McCann, when the latter recently retired from the managership of the main office.

LOUIS F. WISE.
Manager Western Union Telegraph Company, Minneapolis, Minn.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. E. J. Nally, vice-president and general manager of the company, is on his vacation and will be absent for the remainder of the month.

Mr. Charles C. Adams, second vice-president, following the Chicago precedent, was in attendance at the Democratic National Convention at Denver, to look after company interests.

Mr. Charles P. Bruch, third vice-president, is spending the summer at Glen Cove, L. I., going to and from business every day.

Mr. S. B. Haig, superintendent of traffic, New York, was also present at Denver, in his official capacity.

Mr. John F. Skirrow, associate electrical engineer of the company, is absent on his vacation.

Mr. Isaac Smith, superintendent of tariffs, is mourning the loss of his mother, who died on June 28, at her home at Little Falls, N. J.

The Plattsburg, N. Y., and Burlington, Vt., offices have been remodeled, fitted with an entire new equipment and brought up to date in every respect.

Mr. A. C. Kaufman, of Albany, N. Y., having resigned as superintendent of the sixth district, eastern division, effective June 30, 1908, that district has been merged with the first, second and fourth districts, and the boundary lines of all the districts in the eastern division have been rearranged, as follows:

First District—A. L. Edgecomb, superintendent, Boston, Mass., will include all the lines and offices in the states of Maine, New Hampshire, Massachusetts, Rhode Island and the office at Brattleboro, Vt., with the line extending from that point to the Massachusetts state line.

Second District.—E. Kimmey, superintendent, New York, will include the lines and offices in the states of Connecticut and Vermont, excepting Brattleboro, also lines and offices in New York east of a line drawn from and including Malone, and extending to, but not including, Utica, thence to Harford, Pa., not including Binghamton, N. Y., thence to Wilkes-Barre, Pa., Chester, Liberty Corners and Lakewood, N. J.

Third District.—L. Lemon, superintendent, Philadelphia, Pa., will include all lines and offices in New Jersey, excepting those already specified, all lines and offices in Maryland east of and including Hancock test pole, all lines and offices in Pennsylvania, not already specified, east of and including Harrisburg, also all lines and offices in the District of Columbia.

Fourth District—H. D. Reynolds, superintendent, Buffalo, N. Y., will include all lines and offices in New York state west of and including

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Binghamton and Utica, and west of a line drawn from Utica to Malone.

Fifth District—C. E. Bagley, superintendent, Pittsburg, Pa., will include all lines and offices in Maryland west of Hancock, in West Virginia north of and including Morgantown and Wheeling, also the office at Bellaire, Ohio, and the line connecting therewith, and lines and offices in Pennsylvania west and north of Harrisburg and Towanda, including offices along the Northern Central Railway.

As announced in our issue of July 1, the new office at Birmingham, Ala., situated nearly directly across the street from the old quarters, are for temporary occupancy only, pending the erection on the former site of a greater Brown-Marx building, sixteen stories in height, to be one of the finest office structures in the South, into which this company will remove when completed, probably about a year hence. The new operating room will be on the top floor and will be fitted up with every modern requisite for the perfect equipment of such a room, including all tube connections, etc., with the lower floors. On this same floor will be located the office of the superintendent, while the business office on the ground floor will be a model in its way, both for convenience of arrangement and beauty of finish. The present offices, even though for but transient use, are first class in all particulars, with the business office on the first floor, operating room on the second, while the third will be occupied later by Superintendent Hargrave and others.

The Railroad.

Announcement is made by N. E. Smith, superintendent of telegraph of the New York, New Haven and Hartford Railroad Company, of the appointment of W. H. D. Ford as assistant superintendent, effective July 1, and with headquarters at New Haven, Conn.

Messrs. B. A. Allen and C. A. Soans, representing the Homer Roberts Telephone Company of Chicago, recently made a demonstration of their system of despatching trains by telephone on the Delaware, Lackawanna and Western Railroad at the terminal station, Hoboken, N. J.

Among recent visitors at New York of superintendents returning from the Montreal convention, were W. F. Williams, of Portsmouth, Va., superintendent of telegraph of the Seaboard Air Line Railroad; W. P. Cline, of Wilmington, N. C., superintendent of telegraph of the Atlantic Coast Line Railroad; W. W. Ryder, of Chicago, superintendent of telegraph of the Chicago, Burlington and Quincy Railroad, and V. T. Kissenger, of Lincoln, Neb., assistant superintendent of telegraph of the latter system.

Mr. F. S. Rawlins, whose appointment as superintendent of telegraph of the Southern Pacific Company, succeeding A. E. Roome, resigned, with headquarters at San Francisco, noticed in this column, July 1, places in that position a gentleman whose qualifications for the position are of the best. Mr. Rawlins is of eastern birth, a native of Maryland, having been born in Cecil County, that state, on January 21, 1854. Early in life he became a telegrapher, a profession which he followed successfully, for he made it a careful study, at all times a diligent student and wide observer. He was formerly associated with the Southern Pacific at Ogden, Utah, as manager of the telegraph office at that point. While there he gained for himself an excellent reputation in the system which he served. Subsequently he entered the service of the Kansas City Southern road, later becoming assistant trainmaster of the Northern Pacific Railway at Wallace, Idaho, a position he was filling when called to his present place.

Echoes from the Montreal Convention.

The "echo" of the convention, which comes reechoing from all points of the country, is that the meeting was a great affair. This is the testimony on all lips. Many of the railway telegraph superintendents who were in attendance are exchanging felicitations over the happy rendering of a programme admirably arranged to promote their social pleasure. The plan was liberally conceived by those having it in charge, and was carried out in a manner indicative of a broad and generous spirit. As it begins to appear that the splendid courtesy of the Canadian Pacific Railway in conveying as its guests as many as chose to accept the invitation to visit Quebec and return, a trip occupying two nights and a day, with transportation furnished in Pullman sleepers, was due to James Kent, of Montreal, the head of the railroad company's system of telegraph, that personage is winning numerous expressions of golden opinion and of grateful approval. His was a fine thought, worthy alike of the man with whom it originated and of the great railroad company that is accustomed to doing things in a big way. The company, also at Mr. Kent's suggestion, tendered an offer to the active members of the association, of a trip to the Pacific Coast.

The trip to Quebec was a most enjoyable event, and the opportunity to visit that old town was taken advantage of by more than one hundred persons who had attended the convention. Among them was P. W. Drew, of Milwaukee, secretary of the Association of Railway Telegraph Superintendents, who was accompanied by his wife. Returning to Montreal they proceeded to Burlington, Vermont, the birthplace of Mr. Drew, where a number of delightful days were passed in revisiting boyhood scenes.

Among the party who made the Saguenay River trip were William Maver, Jr., wife and daughter, of New York; W. F. Williams, wife and party, of Portsmouth, Va.; I. McMichael, of Toronto, and L. S. Humes, of Montreal.

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Radio-Telegraphy.

The United Wireless Telegraph Company has opened a commercial station at Friday Harbor, Wash., working with Seattle and other Pacific Coast points.

A patent, No. 889,792, for telegraphy, has been awarded to Isidor Kitsee, of Philadelphia, Pa. Another detector for electromagnetic waves is described in which there are two series of metallic plates, one being covered with an oxide.

Word arrived from Honolulu, Sandwich Islands, on July 4, that a wireless message was received there from the signal officer of Rear Admiral Sperry's flagship, the Connecticut, at San Francisco. This, the first wireless message sent across the Pacific, was relayed by the Yankton, which is on her way to Honolulu, and which is arranging daily calls for the voyage of the fleet. Already the local station is in touch with the Gulgoa, the St. Louis and the Glacier, and hopes to get into direct communication with the flagship. It is now able to catch faint signals from the California station.

Patents Nos. 889,789 and 889,790, for telegraphy, have been granted to Isidor Kitsee, of Philadelphia, Pa. Means to receive and translate wireless telegraphic impulses comprise the creation of a high temperature through the incoming impulses, an explosive medium in the region of the high temperature, a conductor adapted to be actuated through the explosion of the medium and a local circuit containing a translating device adapted to be made and broken through the movement of the conductor. The second patent covers details of the receiving device.

The United States Wireless Telegraph Company has absorbed the International Wireless Telegraph Company and will hereafter control the patents and rights held by that company. The International company was mainly a manufacturing concern and was engaged in making apparatus under the Shoemaker patents. C. C. Wilson, president of the United company, says that a number of United States ships have installed his service and that a chain of wireless stations now extends along the Atlantic and Pacific Coasts. The connection between the two coast lines will be made as soon as the stations across the Isthmus of Panama are ready. President Wilson says that as soon as these connections are made messages can be sent from New York to Alaska by wireless. The International company was capitalized at $100,000.

At a recent Royal Society soiree in London, says the Electrical World, L. H. Walter exhibited a tantalum wire point dipping into mercury in a small bottle, as a good detector for wireless telegraphy and telephony and as particularly useful for the latter purpose. In reality Mr. Walter has found that this detector gives louder sounds than an electrolytic detector, which it emulates in other respects, at distances of 450 miles when less than 2 kilowatts was being used. He also exhibited an electrolytic signaling key. It is an instrument for giving Morse signals on circuits using 2 kilowatts or more without any sparking in the air, the current being broken under a solution of ammonium borate in an aluminum valve cell. There are two aluminum disk electrodes facing one another, and separated by a small gap; when the key is depressed, the two electrodes are pressed against one another, so that the current interruption following the next moment takes place across the gas film settling on the aluminum.

Herr Reinhold Sydow, the new German Imperial Secretary of the Treasury, has, according to a special cable dispatch of July 4, to the New York Times, expressed his regret that the American government has not yet seen fit to ratify the international wireless telegraph convention adopted at the conference of the great powers held in Berlin three years ago. England, which proved rather recalcitrant at the conference, has since adopted the convention without reserve, and Germany fails to understand why the United States, which so actively supported the project during the conference, has withheld its formal sanction. It is supposed in Berlin that rival private wireless interests in America are responsible for the Washington government's delay in affixing its signature to the international agreement. The German post offices began, on July 1, to accept wireless telegrams for transmission from the coast to ships anywhere in the world. The postal authorities hope that the public will promptly accustom itself to the new facilities and begin using them on a generous scale.

Book Review.

"Construction and Maintenance of Railway Roadbed and Track," is the latest work of Frederick J. Prior, author of "Operation of Trains and Station Work," and is from the press of Frederick J. Drake and Company, Chicago. The volume affords a praiseworthy treatise on the important subject discussed. The matter treated is gone into thoroughly and will be found of academical value for all intersted in railroading, particularly as the instruction it affords is based on information acquired by practical experience. The technicalities of the subject are sufficiently observed, yet without perplexity to the student-reader Bound in imitation morocco, 590 pages, abundantly illustrated; price, $2.00. This book will be sent to any address, carrying charges paid on receipt of price by J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Device for Solving Alternating Current Problems.

Mr. Thomas R. Taltavall, one of the editors of the Electrical World, New York, has invented what he calls the "Universal Calculator." It is a most ingenious mechanical device. While it can be used for all kinds of calculations involving multiplication, division, etc., as its name would

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indicate, it is more especially designed for solving alternating-current problems, those which embody frequently examples in trigonometry so difficult of working out by the ordinary slide rule. As the working of the calculator is based on strictly scientific principles, its operation can be depended upon not only as a time saver, but as an unerring means of determining results. Its appearance will be welcomed by all who have occasion to deal with vector quantities.

Business Notice.

A set of four illustrated post cards issued by the Stromberg-Carlson Telephone Manufacturing Company, of Rochester, N. Y., picture the extensive plant of that concern to excellent advantage. On one is shown the familiar main office building, with the neatly kept grass spaces in front; another affords a general view of the main office and factories; another that of the long vine-clad factory buildings fronting on Culver road and surmounted by the big sign of the company, while the fourth presents that portion of the main office and factory obtained in the pretty prospect gained at University avenue and Culver road.

Unveiling of the Roebling Monument.

At the unveiling at Trenton, N. J., on June 30, of the monument erected to the memory of the late John A. Roebling, founder of the John A. Roebling's Sons' Company, and the builder of the Brooklyn Bridge, Henry D. Estabrook, of New York, solicitor of the Western Union Telegraph Company, delivered an address that was masterly in detailing the reasons for the perpetuation of Mr. Roebling's fame in granite and bronze. The day was observed as a holiday, 6,000 Roebling employes marching in procession to the point of unveiling in Cadwalader Park. The monument reaches a height of nearly sixteen feet. It bears in decoration a beautiful brass wreath, contributed by the town of Mulhausen, Germany, the birthplace of Mr. Roebling.

John A. Roebling came to this country from Germany in 1831, at that time a young man of twenty-five. In addition to the Brooklyn Bridge, the crowning engineering act of his life, he designed the Wheeling bridge and the suspension bridge at Niagara Falls. Incidental to the development of these structures came the organization of the great factory and industries at Trenton, N. J., where every process employed may be said to have been invented or improved by Roebling, and where a vast network of enterprises now stands as the result of his energy and genius. This company is probably the largest manufacturer of telegraph wire, both copper and iron, in the world. The business, which aggregates in volume $20,000,000 a year, is carried to to-day with increasing efficiency and success by such men as Ferdinand W. Roebling, W. A. Roebling, Charles G. Roebling, of the second generation, as well as by F. W. Roebling, Jr., and Carl G. Roebling, who represent the third generation. Mr. Carl G. Roebling is the son-in-law of Mr. Estabrook, the orator of the occasion of unveiling, referred to.

The Cable.

Mr. Albert Beck, secretary of the Commercial Cable Company, has returned from London, where he has been for the past two months on business connected with the company.

Cable communication was interrupted July 10 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzorote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

Judge Sanford B. Dole, of the United States District Court, has decided the salvage suit brought against the owners of the Pacific Mail Line steamship Manchuria by the Commercial Cable Company, whose cable repair ship Restorer salvaged the liner, by awarding $61,000 to the Restorer. The Manchuria ran on a reef off Rabbit Island, near Honolulu, during a storm in August of 1906.

The Nantucket Cable Sold.

The telegraph cable between Nantucket and Martha's Vineyard has been sold by the United States Government to the Martha's Vineyard Telegraph Company. The Weather Bureau has managed the cable for over twenty years. The cable was laid when the station was established on the island in 1886, but a bad break occurred in it last fall, and as repairs would involve an expense of several thousand dollars the department decided to sell it. The Martha's Vineyard Telegraph Company bought a few years ago the Government cable between Wood's Hole and the Vineyard and has since had the use of the Nantucket cable by courtesy of the Government. The new owners are making the necessary repairs, and the cable doubtless will soon be in working order. This cable is important inasmuch as it carries wireless messages to and from the Nantucket wireless station, one of the most prominent on the Atlantic Coast. H. G. Haddon is the general manager of the company, with headquarters at Woods Hole, Mass.

Municipal Electricians.

The approach of the date for the holding of the convention of the International Association of Municipal Electricians, at Detroit, Mich., on August 19, 20 and 21, reveals an enthusiasm over the affair among members that promises the best results for the meeting. Already a good attendance is assured. A forecast of the character of the meeting may be determined by the quality of the papers to be read on the occasion. These embrace: "Combination Cables for Fire and Police Signal Systems;" "Moving Picture Hazard;" "Batteries for Signaling Systems;" "Testing for and Locating Faults in Electrical Transmission Lines;" "Electrical Equipment of a Fire Station;" "Modern Police Signal System."

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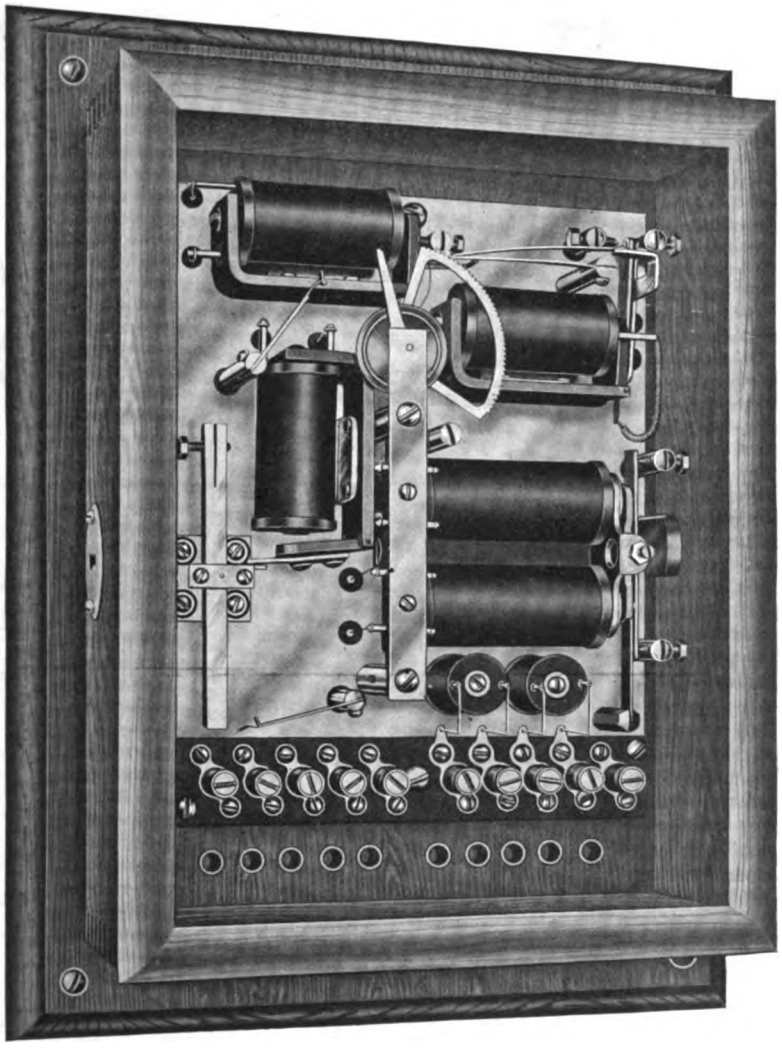

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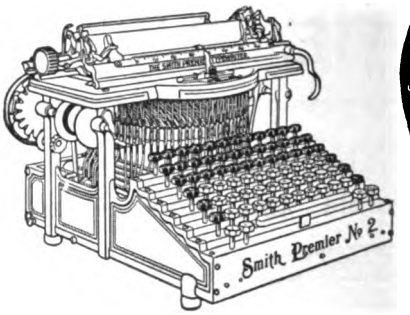

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JULY 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Codes and Their Censorship at the International Telegraph Conference.

As already announced in Telegraph Age as something likely to occur, the final determining of the question by the Conference leaves the position of the code users virtually undisturbed. In confirmation of this Charles P. Bryan, American Minister to Lisbon, and Roland R. Dennis, the special representative of the Department of Commerce and Labor at the International Telegraph Conference there, cabled the following to the State Department: "A board of control consisting of one member each from England, France and Germany will be appointed to censor codes, but codes now in use will not be interfered with, although each government reserves the right it has always had of rejecting any word offered. Codemakers are advised to offer their codes promptly to the board of control for censorship to secure a certificate. This will enable them to assure their customers that every word in their codes must be accepted, no matter in what country it may be offered."

Cable Protection from Trawler Depredations.

Following the consideration in the English House of Commons of the question relative to the protection of the submarine cables, so earnestly urged by the cable companies, various chambers of commerce both in America and Europe, and other commercial bodies, a committee composed of officials of the board of trade and the foreign office has finally been appointed to consider such complaints with reference to the damage done to transatlantic cables by trawlers on the Irish coast, and to devise means whereby this may be prevented in the future. Most of the fishermen are willing, it is reported, to stop fishing at the place on the Irish coast where the damage was done, but a small minority claim that the best fishing is obtainable there.

Doubtless this matter which has disturbed the civilized world, caused such heavy financial losses to the transatlantic cable companies, serious interruption to cable traffic and consequent annoyance and delay to widespread international interests, will be successfully met and overcome. Viewed in the spirit of modern commercial necessities which unite all nations in bonds of reciprocal obligations, it would be impossible to believe otherwise.

The theory, however, to which we hear frequent reference that protection to the submarine cables cannot be guaranteed outside of prescribed three-mile limit, even though interests like those under consideration, affecting the welfare of the world, are at stake, because of the lack of jurisdiction, is but the argument of the ill-informed and of timidity, to which the English mind, be it legislative or not, should be a stranger. It would be monstrous were such a hypothesis to prevail. The fishermen, for the sake of the greater good, should willingly forego fishing in waters, at least by deep-sea trawling methods, which alone renders their peculiar operations so disastrous to the cables, and if needs be find their catch elsewhere; if not then the physical argument represented by the presence of a British gunboat would probably be of a character to command due respect, even by recalcitrant Britons. The cables, which are the arteries of the world's life, must be preserved from all molestation. This is the view we believe the English government will eventually adopt.

A Few Words About Telegraph Age.

In technical telegraphic thought, of a character to instruct, aid and make easier through clear understanding the every-day work of the telegrapher, readers of Telegraph Age are receiving at present in each issue a bountiful and well-directed supply. This is apparent in the fine

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article, now running in series, by William Finn, of the electrical engineer's office of the Western Union Telegraph Company, New York, an expert in his line, descriptive of the Barclay printing telegraph system, illustrated by numerous diagrams which afford a clear insight into the mechanism and working of a system that is attracting so much attention at home and abroad, and which is proving so highly effective in Morse transmission. Another feature is the short, pithy references explanatory of some specific form of apparatus of the Postal telegraph equipment, accompanied by a line drawing of the same, contributed by John F. Skirrow, the able associate electrical engineer of that company, of practical value to every man in the Postal service; and, third, the familiar articles bearing the standing head of "Some Points on Electricity," under which general title Willis H. Jones, author of the standard work, "Pocket Edition of Diagrams," etc., discusses the thousand and one problems in telegraphy that constantly confront the telegrapher, and a thorough understanding of which are so essential to his business welfare.

The amount of information embodied in the several articles referred to is without exception the finest ever furnished the telegraphic reader. It is of a character designed to benefit all in the telegraph service, and no telegrapher, from the operator at the key to those holding the highest positions in the gift of the telegraph, can afford to pass this opportunity to read, ponder and study the material so carefully prepared for his especial benefit.

In addition to all this the pages of Telegraph Age are filled with a variety of miscellaneous matter, original and contributed, pertaining to the general subject of telegraphy, and in its applied form to the wireless system, the cable, to its uses in railroading, etc.; also of the telephone in its relations to train despatching. Every department of the paper is carefully edited, accuracy governs its statements, and the editorial page reflects and discusses current telegraphic thought and events with dignity, power and authority because based on correct information and understanding. The world does not possess another telegraph journal of equal standing with Telegraph Age. It is read and quoted in all parts of the globe. It should properly go into the subscribing hands of every intelligent and progressive American telegrapher, the majority of whom are already its readers. This might be approximately accomplished if present readers who appreciate the paper, who believe in it and think it has earned their co-operation, would send in another name as a subscriber in addition to their own. Is it too much to ask our friends to identify themselves with such a movement? A little effort on the part of the individual would aggregate a splendid advance. As an evidence of appreciation therefor subscribers would receive in return even a better paper than is now produced.

The Closing of Non-Paying Offices.

It must be amusing to telegraph officials to read the testimony of the Westerner as it frequently appears, when his plaint, not to say venom, is directed against the telegraph. In particular, declarations made before the enquiring mind of the Nebraska railroad commission, as well as those of Missouri and Kansas, would go to show that a mistaken, if not guilty, and anyway a shortsighted, policy, animated telegraph management in those states at least, because a few small railroad offices, said to be non-paying, were closed; and further, it was vehemently asserted that such closing was occasioning the loss of many thousands of dollars monthly to the telegraph company's receipts. On what theory of reasoning this liberal and reckless estimate of income was based does not appear. What well-informed person, indeed, can imagine a situation in which a telegraph company permitted thousands of dollars worth of business to escape it!

However, evidence introduced in behalf of the telegraph went to establish the fact that the closed offices complained of in any single state did not turn in an aggregate amount of $50 a month, a conclusion indicating such a paucity, if not to say limitation, of business, as to make the act of closing at once justifiable in the light of duty and reason on the part of the railroads jointly interested with the telegraph in the matter.

We do not care to make any charge affecting the code of morality governing the sturdy cross-roads citizen who will deliberately make affirmation such as that referred to, but no one can call us to account for having our opinion of him.

The Telegraph in Jamaica.

A report on the telegraph and telephone lines of Jamaica states that at the end of the fiscal year, 1907, there were sixty-four telegraph stations and seven telephone stations in operation under the postal system. In addition to these, the railway telegraph service had generally been available to the public. The total number of messages sent was 109,859, being 7,870 more than in the preceding year. All the telegraph offices had been overhauled. The cost of the telegraph system was approximately £7,885. As the receipts amounted to £6,614, and in the preceding years to £5,983 and £4,792, respectively, the cost was considerably in excess of the telegraph receipts. The public works department spent £7,444 on the ordinary maintenance of the buildings and telegraph, and £8,012 on earthquake repairs.

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progressive operator; $1.50 a year.

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The Association of Railway Telegraph Superintendents; Its Past, Present and Future.*

BY W. F. WILLIAMS,
Superintendent of Telegraph, Seaboard Air Line Railway, Portsmouth, Va.

In assigning to me this topic for a paper, your committee has given me such a wide scope that much I would like to say must be sacrificed to brevity. They surely must have mistaken my powers, supposing me to be at once, historian, recorder and prophet. However, it is given us all to learn the past; the present is ours; and it does not require the wisdom of a seer to read the horoscope of an organization whose watchword is "Go Forward."

Having had the honor and pleasure of membership with this delightful and profitable body but twelve of the twenty-seven years of its existence, I can speak of its early history only as I have gathered data from different sources. In 1882, several railroad superintendents of telegraph happened to meet in the office of Colonel Robert C. Clowry in Chicago. During a discussion of matters of mutal interest, Mr. W. K. Morley, of the Chicago and Alton Railroad, suggested the formation of an association, and on November 20, 1882 a meeting was held in Chicago, at the Grand Pacific Hotel, at which Mr. Morley was elected president, Willian Kline, vice president, and C. S. Jones, secretary. Committees were appointed to draft a constitution and a form of service card.

The second meeting was held at the same place June 13-14, 1883, at which the roll showed forty-three members, representing thirty railroads. At this meeting, Mr. Morley was re-elected president and P. W. Drew, secretary. How long, and how ably, and how pleasantly the latter has served in this capacity, we all know. Physicians say "a man is as old as his arteries." I have recently read with much interest that D'Arsonval, the celebrated French experimenter, has invented an apparatus to prevent the encroachment of age. By applying a high frequency of electricity, with vibrations as high as one hundred millions per second, the walls of the arteries are kept from hardening, and the blood, finding no resistance, speeds on its round giving health and life and youth—a veritable Ponce de Leon having been discovered. I am sure I voice the sentiment of each member of this organization, when I suggest that our first duty is to see that our beloved secretary is at once made the object of this wonderful rejuvenator, and in the event one application does not bring the desired result, we give him two, so that, paraphrasing a well-known couplet, we may say of him:—

Men may come and men may go,
But Drew goes on forever.

The third annual meeting was held in Philadelphia, September 17, 1884. The records of each succeeding meeting show that interest never flagged. This coming together proved such a well-spring of thought, that the membership increased, each one eager to profit by the mutual interchange of experience and observation. Manufacturers began to take note of these gatherings, and knowing the inquisitive character of these men searching for the latest and best inventions to assist them in their work, decided that in one respect at least they were all "from Missouri," and at the sixth meeting in Boston, held in June, 1887, the first exhibits of telegraph and other electrical devices were introduced, and this has proved a most interesting feature. Recognizing the value of this innovation, the constitution of the association has been so amended as to permit manufacturers or their representatives to become associate members.

Meetings have been held in various states, from Canada to Louisiana, and from New York to Colorado. The one held in Wilmington, N. C., in May, 1899, was made memorable by the fact that we had as our guest of honor Thomas A. Edison, the greatest inventor of the age. The "silver anniversary" was held in Denver in June, 1906, and the meeting of 1907, in Atlantic City, still so fresh in our minds, brings us to the present time. The projectors of this movement "builded wiser than they knew." Our latest information places the total railway mileage in the United States, January, 1908, at approximately 230,000 miles of line. The membership of this organization represents 175,000 miles or 76 per cent of the whole. There are eleven systems, representing 11,450 miles, which have superintendents of telegraph, who have not identified themselves with us. The remainder, or 63,550 miles, is made up of small lines, varying from three to 1,900 miles with no telegraph superintendents. These figures speak for themselves. No more eloquent tribute could be paid to the popularity and value of our association, and no more forceful evidence of the alertness of the men having in charge the telegraph interests of the various railroads they represent and their determination to keep in the front rank and up to date in all that pertains to the betterment of the service.

The history of the association shows steady advancement in every way. The papers presented and topics discussed have been of wide range, and practical good has been evolved in these recitals of knowledge wrought out of the experiments, tests and trials of every day life. The quality of the discussions clearly reveals wide research and diligent investigation, a determination to get at the root of things. And so to-day we stand with problems old and new before us. In the field of electricity developments follow in such quick succession that one point is but fairly settled when another more important and far-reaching confronts us. The secular press tells us that a Frenchman has invented a little machine which will enable a man in New York to see what

* Read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

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is going on in Paris. A Danish inventor is credited with having solved the problem of transmitting a photograph by wireless telegraphy. A scientist in Portland, Oregon, has invented the "Teleone," which enables parties conversing over the telephone to see each other. None of these are more improbable than others which have been fully demonstrated and are now in daily use.

One of the most vital issues before us to-day is despatching trains by telephone, a proposition which in the early history of our meetings would have brought a smile to the lips of the most credulous. But the handwriting is on the wall, the practical working of this admirable scheme has become an accomplished fact—and facts like fire make people move. I predict that the next decade will see a marvelous revolution along this line. Would not the "Teleone" be an additional safeguard?

So the future looms before us big with possibilities, weighted with responsibilities. We must work, study, experiment and together thrash out the knotty problems as they come to us, realizing that on us rests the upbuilding of the branch of railroad service entrusted to our care. Nothing "succeeds like success," and this association has been an unqualified success. What it has been it will be. The personnel is composed of men who are conscientious, honest and earnest—who appreciate the opportunity afforded them by these annual reunions for absorbing the best thoughts of men who are daily meeting and mastering the complex conditions which arise in the administration of the duties which devolve upon them.

I cannot close without saying that no agency has been so helpful, no source of information so fruitful to me in my daily life, as the meetings of this association. When to this is added the charm of its social feature, I feel that it is indeed a privilege to be "one of the boys." In the language of Rip Van Winkle, "May you live long and prosper."

Reduction of Telegraphing by the Use of Printed Forms.*

BY O. C. GREENE,
Superintendent of Telegraph of the Northern Pacific Railway Company.

When I was requested to write a paper on "Reduction of Telegraphing by the Use of Printed Forms," I was inclined to hesitate about complying, as it seemed to me there was not much that could be said to a body of men so well posted on this subject, as all of you undoubtedly are, that would be either interesting or instructive.

There is no doubt that where there are any considerable numbers of routine reports of similar character, the use of an intelligently arranged blank form materially reduces the amount of telegraphing. When the requirements are known, it is a comparatively easy matter to make up a blank form, with suitable columns and headings, to meet them. An arbitrary designating letter should be placed at the top of each column and, when necessary, at the beginning of the line, which should, of course, be transmitted by the sending operator, to indicate to the receiving operator which space to use. Care should be used in selecting this index letter to use Morse characters which will not be apt to combine easily with those of the numbers or words most likely to follow it.

To obviate the difficulty the receiving operator is likely to experience in finding the proper place, especially if the blank is large and the sending operator inclined to be very ambitious, the spacing should be rather liberal and the subdivisions of the form should be separated by heavily ruled lines; otherwise, so many errors, due to operators using the wrong spaces, may follow, that the saving effected by the use of the blank is likely to be largely offset by the number of messages made necessary to secure corrections.

Multiplicity of forms is objectionable. As a general thing the telegraph tables are pretty well crowded and considerable time may be lost by operators looking for the proper blank when there are a great many to select from. While the use of blank forms is undoubtedly advisable when the amount and character of business justifies it, there is, therefore, a chance of overdoing it. Conditions frequently change, requiring additional or somewhat different information, and it will be found that many times a slight change in some of the established forms can be made to take care of this change in conditions, rather than making a new blank for the purpose.

The Northern Pacific Railway, which I have the honor to represent, being long and the general offices located at one end, necessarily carries on a great deal of its business by wire, hence a large number of forms are in use, which greatly reduces the volume of telegraphing.

Should any of the gentlemen present be interested, I will be glad to present them with complete sets of our blanks upon application.

* Read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

The unaffected simplicity of the character of Andrew Carnegie was pleasantly illustrated lately when he attended the ceremony of laying the corner-stone of the new Pan-American Building at Washington, D. C., the erection of which his generosity has made possible. On the occasion in question as he approached the directors who were waiting to receive him, his first inquiry was for "Joe" Kerbey—Major J. O. Kerbey, an employe of the Bureau, whom he had not seen in years, and whose father he had known when the latter, at the time one of the older officials and himself were associated with the Pennsylvania Railroad. The meeting was a cordial one, and at parting the farewells were heartily spoken, Major Kerbey by reason of old acquaintance inadvertently exclaiming, "Good-bye, Andy!" to which Mr. Carnegie laughingly replied, "Good-bye, Joe!"

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Commercial Reports.*

BY JOSEPH P. CHURCH,
Chief Clerk, Telegraph Department, of the Wabash Railroad Company.

I find it about as difficult to write about commercial reports as the average operator does to make them up, but have tried to include a few practical suggestions looking toward simple but systematic methods of handling them.

I assume that it is not desired to consider the question of improving the present rules as contained in the tariff book, and indeed they seem, if intelligently carried out, to cover all requirements fully, and suffice in the hands of the telegraph company's experts to reach all delinquents, especially in the collection of deficits on error sheets. We recently received for collection an error sheet amounting to twenty-five cents, on a message handled twenty-one years ago, and a system so far-reaching could scarcely be considered inadequate.

It is difficult to lay down specific methods of instruction supplementary to the rules, on account of the difference in details on the various roads. I understand that the Western Union and Postal rules are practically the same, and that the manner of making reports is consequently similar, and there is probably no greater difference between them than obtains in the practice of the different roads handling commercial business for the telegraph companies.

On the Wabash, the reports are sent to the superintendent of telegraph, where they are carefully audited and corrected, and sent to the several Western Union superintendents, with consolidated statements on form 23, and a comparative statement with the same month of the previous year. The telegraph receipts, however, are remitted by the managers direct to the Western Union treasurer accompanied by form 65 (letter of transmittal), and a statement of manner and amount of remittance is forwarded to the superintendent of telegraph on form 1517, enclosed with the other reports.

Error sheets come to the superintendent of telegraph from the Western Union district superintendents, and are copied in the error sheet book, and then sent to the various offices with a receipt card and a sufficient number of postal cards, form 47, for adjustment. The receipts are carefully checked in and tracers kept going in such cases as are necessary, until the error sheet is returned. The money covering deficits is returned to the superintendent of telegraph with the error sheets and over-check vouchers, and remitted by him at the close of each month, together with a statement covering the error sheets returned.

When Mr. G. C. Kinsman, superintendent of telegraph, turned this matter over to the writer he suggested that the best way to secure prompt and correct reports was to insist upon careful and comprehensive records being kept by the managers, and I believe this is the key to the whole situation. The time for the manager to begin to make up his report is when he handles the first message, and he should be required to keep a proper file of all commercial business separate from the railroad files, and each day by itself.

For the average office, a simple file of about three divisions will be sufficient for the current month. The first division should be large enough to hold all the messages handled during the month. The other two divisions will require only sufficient space for the messages held out to go in with the reports in one, and the error sheets and correspondence relating to them in the other. If nothing better is available, a table drawer for the messages and two large envelopes for the other divisions will answer.

Each day's business should be assorted carefully on the morning following and placed in alphabetical order by states, and after proper entry in the check ledger; copies should be made of the "uncollects" and "guaranteed" messages, and the service messages relating to them; also the "sent free," "half rate frank," and all government messages that go in with the reports, as vouchers for tolls, and these copies filed in proper order with the other messages for that day, care being taken to wrap or tie up each day's business separately for convenient reference. Service messages should be attached to the messages they refer to, with pins, or pasted on one corner.

Daily records should be made showing amount of the receipts and the number and kind of messages handled, both "sent" and "received," so that this information will be tabulated and ready for use in making up the reports. This record can be kept on the check ledger by writing suitable headings at the top, and will only require half of one page each month.

The original messages held out to go in with the reports can be kept in proper order in the second division of the file, until reports are made up at the close of the month, leaving the third division for error sheets and correspondence of the current month. Press or carbon copies of the reports should be made and filed with the messages of the same month. If the daily register form 40 is used, that and the check ledger can be kept on top of the messages in the first division of the file. In addition to the three division file, the manager will need a place to store his stationery supplies conveniently, with a separate shelf for the eight bundles of messages that he is required to keep on hand.

It will scarcely be necessary to provide a money drawer, as the manager can use one of his vest pockets for that purpose. The only Western Union office the writer ever managed took in between twenty and thirty dollars a day, and I carried the Western Union cash in one pocket and my own in another. This arrangement worked very well—the only difficulty being to preserve a proper balance between the pockets.

* Read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

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If the managers can be induced to adopt some simple system of filing the messages and daily make copies of such as will be required to go in with the reports, a few minutes work each day will keep their files in good condition, and enable them to make up their reports easily and accurately at the close of the month, and reduce the number of error sheets.

Instructions to managers should be as brief and simple as possible, but they should be constantly admonished to study the rules carefully and obey them implicitly, referring doubtful points to the superintendent as they come up, and if they follow the practice of making up their reports daily they will have ample time to obtain advice on all obscure points and be prepared to send in their reports without delay at the end of the month.

Experience indicates that operators are frequently careless about complying with the rules to see that all messages are written on or attached to the sending blank, and that they often omit the filing time on "sent messages" and sometimes neglect to endorse the time on messages received, and time of calls on delayed messages. They should be specially cautioned on these points and also impressed with the necessity of taking receipts for messages delivered and filing these receipts with the day's business.

Canada's Fastest Man.

BY J. W. HAYES.

There were a bright lot of choice spirits in the old St. Louis Western Union office away back in 1876. Some were gray-haired, others were middle-aged, but more were of the younger contingent. All, however, were imbued with the spirit of energy, of loyalty, and the earnest desire to give value received for their monthly salaries. There was no shirking; "sojering" would not be tolerated by any member of the force, and any "chair warmer" would be scouted and reported to the officials by any member of the loyal force. But as a matter of fact we really had no "sojers" in those days. There was a certain amount of work to be done, a certain number of wires to man and just enough operators provided by the company to do the appointed work. The night force came on duty at 5 P. M., and were off when their wires were clear and never before. This was one incentive to get in and hustle, besides the other very proper inducement of wanting to do the square thing by the company.

I was very young at that time, but full of ambition to rise in the profession. I was assigned to the Long Horn wire, a single wire that ramified the entire length of Texas. Oh, my! but those were "hot" boys down there. We would exchange seventy-five messages each way with Galveston, fifty each way with Houston, about twenty-five each way with Dallas, and the same with Sherman, and about fifty or seventy-five more with way offices, such as Denison, Palestine, etc. We were obliged in consequence to handle four hundred messages and more each night. There were no bonuses in those days, and as there was more or less fighting for circuit, we had to work fast. The operators in Galveston never pretended to send anything more than "g" for Galveston or "NY" for New York. No dates were transmitted and periods and "sigs" and all unnecessary trimmings were carefully cut out to save time. It was all right after one got acquainted with the business and had a supply of "dated blanks," and I still hold in reverential regard my friend, Theodore P. Cook, who worked this wire days and who always saw that I had an ample supply of dated blanks to anticipate and resist any rush. Mr. Cook is now general superintendent of the company at Chicago, but his official position, honorably earned, does not impress me with as much regard as the recollection of past courtesies in the way of swapping dated blanks. We always managed to get our "closer" before midnight and everybody worked earnestly to accomplish this end.

There were no women on the main office force at that time, and the only lady operator in St. Louis working for the company in 1876 was Miss Belle Wise, who was manager of a branch office at South St. Louis. William T. Loper, Thomas P. Wheeler, James A. Murray, Sidney B. Fairchild, James S. Nelson, Charles T. Day, John and Samuel Cassidy, Lara M. Boone, the Eckert brothers, John McNevin, Joseph McIlvaine, Paul Murphy, Michael Tully, William Manley, Dave Ryan, John H. Topliff, Fred B. Moxon, Robert W. Irwin and the writer made up the full complement of the night force. Charles J. Lawson, now of the New York force, was the night chief operator and a very well-meaning fellow he was. I have worked in many offices and with a great number of operators, but I never associated with a better lot of men and operators who had the interest of their employers more at heart than were those in St. Louis in 1876. I want to bear testimony to the fact that this harmonious state of affairs was largely due to the presence of Colonel Robert C. Clowry, at that time superintendent of the company, who was always ready to grant an audience to any complainant and equally ready to adjust any grievance. He was large hearted, just, easy of approach and was ever on the right side.

Robert W. Irwin, of the operating staff, was a Canadian by birth, coming from a country which has long enjoyed the honor of supplying us with much of our best telegraphic talent. It cannot be said that "Bob" Irwin was considered a good receiver in those days, but he was a great sender, and Fred Moxon had facetiously dubbed him "Canada's fastest man." The title was somewhat euphonious, Irwin liked it and made a continued effort to maintain his right to it.

One Sunday night "Sid" Fairchild was acting as temporary night chief and we had been working unusually hard to get off early. Irwin was working the New Orleans wire with Albert S.

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Ayres at the far end. He had just finished sending seventy-five messages and was ready to say "closer," when New Orleans announced that his New York wires were down and asked St. Louis to relay one hundred and fifty messages for "N. Y."

"I can see my finish," ejaculated Bob Irwin. "I have been pasting 'Patsey' Ayres and here he comes back at me."

A hurried conference was held relative to the New Orleans request with Fred Moxon, who took the matter up with Night Chief Fairchild, and who good-naturedly consented to do anything that would please the boys. The New Orleans wire was presently cut in on a quartet table on four different sets of instruments, at each of which sat Loper, Day, Wheeler and John Cassidy. New Orleans was told to go ahead and "boil 'em down." "Get 'em in inside of an hour," tauntingly said St. Louis. A tightening of the key at the Gulf end and then came a fusillade of dots and dashes. "Drop out the date; don't say 'red' for night messages; skip the period; never mind the 'sig'; cut 'em to the bone."

Ayres outdid his best efforts on this occasion. So fast did the messages come that it took the combined talent of the four operators gathered about the table to copy them. Loper took the first, Wheeler the second, Day the third and Cassidy the fourth, with Loper to begin again on the fifth. Ayres was sending three abbreviated messages a minute and as the reputation of the St. Louis office was at stake there could be no breaking. When the last message had been sent by Ayres it was announced that he had transmitted one hundred and fifty messages in fifty-eight minutes, beating any known record.

"You're a dandy," said Ayres. "O. K. RI," replied Irwin, and there the incident closed as far as the office was concerned.

Over our dinner plates that night we discussed the great feat, for it really was a great performance, and it was decided to bury the incident, so far as relating it was concerned, as it was thought an innovation like this would not meet with the approval of the officials. We carefully watched the service messages between New York and New Orleans for the next few days, but, wonderful to relate, there was not a single request to have any of the Irwin bunch repeated.

Although it took four of the finest men in the country to do this work, Bob Irwin got the appellation of "Canada's fastest man," by which he was known to the day of his death. I am told that in a quiet little spot in a Texas cemetery is a marble slab, erected by his loving co-workers, which bears the following inscription:

"Sacred to the memory of Robert Waldo Irwin, telegraph operator. Canada's fastest man."

Telegraph Contest in Mexico.

The telegraphic contest in the City of Mexico, early in June, proved to be an interesting affair. It was held at the rooms of the central telegraph office in Calle del Cinco de Mayo. A large number of local operators took part in the contest, and the jury was composed of Eduardo Picazo, the telegraph operator of the presidential office; Ruben de la Peña and Moises Salazar, all of them being experts in telegraphy.

The jury accorded the first prize to German Perez, who transmitted 107 words in three minutes without any error and with good spelling. The average was 35.6 words per minute. The second prize was granted to Eduardo del Prado, who sent 107 words in 2.45, but had two errors, and while the spelling was good, he used no punctuation in the whole message.

The third prize was granted to Agustin Morales, who transmitted 107 words in 2.50 making an average of 37.8 words per minute. He made an error and used no punctuation, his spelling being clear and firm.

The Glass Cover of a Stock Ticker As An Incubator.

An operator in a western telegraph office is sure that his invention for hatching chickens is better than an incubator or the old-fashioned hen, because these agencies of incubation never claim to make a one hundred per cent. hatch, whereas by his invention, on the very first trial, this result was obtained.

A short time ago he set sixteen eggs under the glass cover of a stock ticker in the operating room, with an electric wire connection to furnish the heat, a thermometer to record the degrees and a thermostat to watch the thermometer and to set at work an incandescent light to burn up the surplus heat whenever the thermometer registered higher than 105.

The other day he found sixteen little chickens under the glass, all as well and happy as if they had come to life under the protecting wings of a motherly biddy.

A lineman working fifty feet up in the air, at Denver, Colo., the other day, says the Daily News of that city, touched a live wire, was shocked unconscious in a moment, and lay, slowing burning to death, across a tangle of wires. A fellow workman was eight feet away on another pole, but he leaped through the air, caught with his climbing irons on the pole below the suffering man and a moment later was lifting him from danger. A slip, or the breaking of the climbing irons, would have meant instant death to the rescuer. But he did not slip, and the irons did not break; probably he never thought of the matter till his friend was safe. Deeds like these are heroic deeds. They add to the proof, already abundant, that war is an utterly unnecessary school for valor. They show that nerve and quick decision and readiness to stake all on the moment are qualities which peace can produce in quite as full measure as the tented field.

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Adverse Legislation — Its Possible Ultimate Effects on Telegraphers.*

BY E. A. CHENERY,
Superintendent of Telegraph of the Missouri Pacific Railway.

Within a period of two years past, following their efforts and success in very thoroughly effecting a strong organization, a spirit of unrest, in keeping with the times, has pervaded the ranks of telegraphers engaged both in railroad and commercial fields, and it only needed the torch of disgruntled agitators to fan the flame through a hitherto unthought of method—legislation—into a blaze that it seems to the writer is fraught with possible disaster to the profession.

There are three classes of legislation, internal, state and national, that at this time seems to contribute as a demoralizing factor against the welfare of the telegrapher. Internal legislation may be considered that which applies as between the telegraphers as a class, and the corporations with which they are identified.

Nearly all the trunk lines at this time, following the custom of having working schedules with employes in the various trades, have entered into similar relations with their telegraphers, and it is but fair to say that such a policy if made and carried out with the fundamental purpose of preventing abuses to a particular class, is beneficial in a general way, although personally the writer cannot believe that all the rules and particularly those relating to seniority are conducive to the encouragement of ambition and advancement.

Some of the schedules are secured after a long struggle, due to the fact that the committee delegated to frame the requests often assume an attitude of hostility to the management and convey the impression that the employer is a sworn enemy and must be so treated. In the preparation of such agreements the principal object should be to insure as nearly as possible a uniform working arrangement for all divisions, providing reasonable hours of service, an opportunity for a hearing in the event of fancied or real injustice and compensation commensurate with the duties and experience required, location and other conditions being also considered.

These schedules are made to be observed and managements are anxious that the provisions are not violated, recognizing in them as sacred an obligation as is expected of the employes in complying with the rules laid down for their guidance by the company.

There is a certain element, however, who rebel at any order that may be issued; who look upon a letter of inquiry for desired information, as an attempt to harass them, and the writer has known of several cases where the employe before making reply to such queries has first communicated with his chairman to ascertain if the superintendent or other superior officer was not transgressing upon what he considered the conferred rights of the schedule.

Such an element find it very convenient to complain of alleged violations on the part of their superior officers and at the same time criticise the actions of their selected committee in permitting the practices which they consider burdensome to continue. They are usually handy with pen and speech in vituperation and consider an ideal schedule only that which contemplates a stated minimum salary with liberal compensation in addition for handling tickets, freight, telegrams, express, mail and all other duties that may be assigned. These extreme examples are not altogether rare and are of such a character as to breed discontent among the larger number of employes who are taught that their awakening can only result from a following of such precepts.

Could these employes be but brought to a realization of the sense of allegiance they owe themselves and their employer and strive to qualify and merit promotion, it stands to reason that their prospect for advancement would be greater.

What commercial business house could succeed if their salesmen banded together in an effort to force rigorous rules and to prevent any one man, regardless of his experience, from serving at a lesser rate than his older and necessarily more competent comrade. Would the head of such a concern feel disposed to offer a partnership in the business to one of that class of employes, or would he rather choose from among those who had at all times proven competent and loyal to his interests?

Not content with the working schedules they had entered into with their employers, presumably in good faith, the telegraphers as an organization conceived the plan of enlisting the efforts of their state and federal representatives in an endeavor to secure shorter hours of service, relying on their organized strength to maintain the present or an advanced wage scale, and state and national legislation relating to the employment and regulation of telegraphers has been active within the past two years.

Maryland was the first state to enact a law prescribing eight hours for telegraphers engaged in reporting trains, and the example was soon followed by other states, in many of which the law was to become effective sixty days from date of passage, allowing the railroads scarcely any time for preparation. In seeking this legislation, the telegraphers who were delegated to assist in having the acts become a law neglected to call attention to the fact that train despatchers and telegraphers working tricks requiring constant and close application were then and have been for years working but eight hours daily, and the attempt was made to have such hours apply to all without regard to the responsibility assumed; no distinction being made as between a despatcher directing train movements and telegraphers who

* Read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

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mechanically receive and deliver such instructions to the trainmen who are to obey them.

No one familiar with the work at the various stations of a railroad would honestly make the claim that the "mental strain" on a telegrapher on duty at a station where the number of train orders received varied from two to ten each month, or even that number in each twenty-four hours, was particularly severe or compared in any manner with the duties in a despatcher's or heavy division office, where close application is required and the work correspondingly heavy. In the one case the hours of duty may extend over a period of eleven hours each day, but the actual work is not heavy and there are in many cases long periods with nothing whatever to do. In the other case, the hours of duty are fixed at not more than nine and many at eight or less.

A case where one accident resulted in great loss of life which occurred through the negligence of a telegrapher failing to display his signal to one of the trains involved, has been recited before every committee having such bills to consider. The claim was made that the telegrapher at fault was overworked, but the full facts in the case of his companion operator going to a neighboring city without securing permission from the despatcher or superior officer, or with their knowledge or an understanding made by the two men to double, was not explained.

In a few of the bills introduced a modification was suggested that the law should apply only at stations where the number of passenger trains passing in a twenty-four hour period exceeded eight in each direction, but this attempt to regulate the hours of service to the work performed met with vigorous opposition and protest and demonstrated the fact that methods absolutely unfair are resorted to in an endeavor to gain their point.

While these and hundreds of other bills directed against the railroads were being discussed in the several states, a bill was under discussion in the House and Senate providing a maximum of sixteen hours during which railroad employes affecting train movements would be allowed to labor and stipulating the number of hours of rest such employes should have before resuming duty. No particular class was mentioned, and in the last days of the session after the bill had been favorably reported to both Houses, a proviso was added by the House to the second paragraph reading as follows:

Provided, That no operator, train despatcher or other employe, who by the use of the telegraph or telephone, despatches, reports, transmits, receives or delivers orders pertaining to or affecting train movements, shall be required or permitted to be or remain on duty for a longer period than nine hours in any twenty-four hour period in all towers, offices, places and stations continuously operated night and day, nor for a longer period than thirteen hours in all towers, offices, places and stations operated only during the daytime, except in case of emergency, when the employes named in this proviso may be permitted to be and remain on duty for four additional hours in a twenty-four-hour period on not exceeding three days in any week.

In this form the bill was sent back to conference, and after further discussion a second proviso was added reading:

Provided further, The Interstate Commerce Commission may, after full hearing in a particular case and for good cause shown, extend the period within which a common carrier shall comply with the provisions of this proviso as to such case.

The bill so amended passed both houses and was signed March 4, 1907, to become effective one year after its passage, and did go into effect on March 4 of this year.

Considering the welfare of the telegraphers, I cannot believe that shorter hours of service was wanted or desired so much as a maintenance of an established wage scale and constant employment and the advantage of fitting themselves for promotion. No request by a committee for a reduction in the regular hours of service was ever made to my knowledge, and these experiments in legislation of licensing telegraphers, the prohibition of employing any one under twenty-one years of age and other similar measures that have received attention, were directed at the railroads through the efforts of the leaders of the telegraphers' organization to force a closed shop and to create a demand that would apparently benefit the present employes, but which is now acting as a boomerang.

The telegraphers, in what I believe mistaken zeal for the general good of the profession, have in every way possible discouraged the teaching of the art and as a result the timber from which such material has been made of recent years has not been such as to justify the faintest suspicion that the percentage of future officials will be among the high figures of the past. The president of the telegraphers' order in discussing this feature at Washington, recently, admitted that less than 365 students each year was authorized and permitted to be taught telegraphy by members of his order, although claiming a present working force of upwards of 53,000 telegraphers in the United States. At this rate of sanctioned manufacture the last of the 53,000 telegraphers now employed would be released from active service in approximately 145 years. These figures would be changed somewhat if the mortality were lengthened or comparatively few additional positions created.

The biblical paragraph, "What profiteth a man" may be converted into "What profiteth the telegraphers as a class if they gain a few additional hours of idleness by losing their prospect for advancement."

A few are temporarily benefited in the shortening of their working hours, but is this conducive to a promising future? The passage of such laws necessarily has a demoralizing effect. Its tendency is to provoke discontent and stifle ambition; it encourages a revolution in methods and its ultimate effect cannot but be harmful to the telegraphers as a class. Already some of the

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roads having adopted the telephone as a substitute for the telegraph in the handling of trains, their officers wonder why they were so long in discovering its advantages.

Other roads are falling into line, and it is safe to say that within a very few years the telephone will be in service by all the roads for such purposes of communication as it requires. When this becomes the universal practice, the offices now manned by telegraphers will then be in charge of young men or young women employed in their home town, and who may be put to work after a coaching of but a few days, and many of the skilled telegraphers will then be relegated to the scrap heap of "has-beens."

Does it argue for the good of the telegrapher that the telephone which may be operated by anyone is rapidly being installed; that printing telegraphs are being perfected and put into service, and that the best thinkers along these lines are working much more than nine hours a day in an effort to devise some means of getting away from the aggressiveness of a class of employes who consider the interests of the railroads as secondary to their obligation to the order they represent?

The railroads under existing methods are necessarily obliged to secure their agents and train despatchers from the telegraphers, and from such employes higher officers heretofore have been selected. If a departure from such methods in the use of other devices—which now seems more than probable—is made, will not the personnel be strengthened by a selection more desirable, generally better qualified and more reliable and a new class of employes evolved whose individuality is not stifled by their allegiance to a false god?

Telegraphers' Cramp in England.

The Postal Telegraph Clerks' Association of England has been successful in getting the serious question of telegraphers' cramp considered by the home office committee, the representations of the association in this respect being finally received in a sympathetic spirit. A local paper in discussing the matter had this to say:

"It is not unusual to find that a few years' work is sufficient to play havoc with the arm and nervous system of an operator. Hitherto it has been the custom of the department to treat the disease as of purely nervous origin, due either to the sufferer's own fault or to an inherent tendency due to particular nervous temperament. The punishment has taken the form of, first, arrestment of increment; second, reduction of salary, or, third, compulsory retirement.

"Many excellent men, some of them with considerably over twenty years' service, have been so punished, and about twenty instances were cited to the committee. It was contended by the delegates that the cramp does not detract from the sufferer's general condition of health or decrease his efficiency in other directions than key signaling. Suggestions were made with a view to a remedy, among them being that telegraph operators of longer service should not always be selected for the busiest and most important circuits; that six hours a day be the maximum period for an operator sending on a Morse circuit; that non-manipulative duties, such as clerical work, should be more evenly distributed; that ambidexterity should be encouraged; that the Morse key should be improved; that the staff should be less crowded and uncomfortable; and—most important of all—that persons suffering from cramp should be treated sympathetically."

From statistics furnished it is apparent that what is known as writer's cramp is more prevalent among telegraphers in England than in the United States. Many English telegraphers assign as a reason for this discrepancy the use of the clumsy Morse keys used in that country. English operators as a means of amelioration of their condition, owe it to themselves to look into the merits of the dot-making devices so extensively used by telegraphers in this country. These instruments, together with various forms of transmitting typewriters, have no doubt contributed to lessening the disease mentioned in America.

American Institute of Electrical Engineers Meet in Convention.

The twenty-fifth convention of the American Institute of Electrical Engineers met at Atlantic City, N. J., on June 29. During the session of three days many important papers covering electrical subjects were read and discussed. A paper entitled "Electricity as Viewed by the Insurance Engineer," was read by C. M. Goddard, secretary of the Underwriters' National Electric Association, Boston, Mass. Mr. R. A. Fessenden read a paper entitled "Wireless Telephony," in which he gave a brief historical review of the development of wireless signaling. The first period began with the work of Henry in 1838 and ended with 1902. The second period, beginning with 1902 and continuing up to the present time, has been marked by the gradual abandonment of the damped-wave coherer system and the substitution of the elements of the sustained-wave non-michrophonic contact type. A good deal of the new apparatus devised in this work is described. Regarding the possibilities of this system, Mr. Fessenden thinks there is no immediate prospect of its taking the place of local exchanges, but there is a good field for it for long-distance lines. For transmarine work and communicating between ships it is exceptionally well suited. Regarding the range of transmission, there is little difficulty governing distances of one hundred miles. Beyond this atmospheric absorption begins to make itself felt. The author also explained his views of the retarding effect which the various governments of the world have exerted on the development of this important new art.

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Railway Telephony.*

BY W. E. HARKNESS.
Sales Engineer for the Western Electric Company, New York.

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(Concluded from page 468, July 1 issue.)

The New York Central equipment has been subject to careful observation by the operating officials of the road and it has been found that the trains on this section of the division have been handled with safety and in addition with greater speed than when operated by telegraph. In fact, it has been found that the despatcher operating this circuit is busy about fifty-five per cent. of his time, while the other despatchers handling the same trains on the remaining sections of the same division are kept busy all of the time. This, however, is not the greatest advantage of the system. It has been found that the despatchers and the operators are in closer touch with each other on the telephone circuit, and assume more personal relations due to this more detailed information regarding the movement of trains is transmitted when conversing by telephone than was possible by telegraph. The number of small matters which are called to the attention of the despatcher affecting the movement of trains can be taken care of instantaneously and instructions issued as quickly as the information is received. If necessary the conductor of the train or the engineman can be called to the telephone and the details of existing conditions received at first hand rather than through an operator. It further permits of the superintendent of the division, or higher officials, to talk with the man on the ground, in case of accident or unusual delay, and issue instructions if necessary. The telephone circuit has been found to operate under all conditions of weather which ordinarily would interfere with the operation of a telegraph circuit.

The amount of money which it is possible to save in this way cannot be estimated, but it is greatly in excess of the cost of the telephone line and equipment necessary to accomplish these results.

The Chicago, Burlington and Quincy Railway during the early part of this year also installed the telephone for despatching service on their main line between Aurora and Mendota, a distance of forty-six miles; Aurora and Chicago, a distance of thirty-seven miles, and between Aurora and Savannah, a distance of one hundred and eight miles, in all about one hundred and ninety-one miles.

The method of wording and issuing the orders on these circuits is practically the same as that used on the New York Central, but the method of selective signaling and the apparatus used is quite different. Each station is equipped with a special transmitter arm and head telephone with the necessary induction coil and batteries. A high resistance and high impedance relay is bridged across the line at each station. A selective device consisting of a clockwork on which is mounted a commutator having two narrow segments, diametrically opposite each other, is also located at the station. These segments are connected together and form part of the circuit of a locking relay controlling the signal bell. The circuit of this locking relay is completed through a brush resting on the surface of the commutator, which momentarily makes contact with one of the segments during each half revolution of the commutator, and also the contacts of the bridged line relay.

The clockwork is prevented from running continuously by a stop which is electrically controlled. The stop or starting relay, as it may be called, is controlled by the relay bridged across the telephone circuit and is operated when an impulse of current is sent over the line by the despatcher. The mechanical arrangements are such that after the clockwork has been released and starts to run the commutator is permitted to make a half revolution. The continued operation being prevented by a mechanical stop and the mechanism is again ready for the next call. By this arrangement the direction of rotation of the commutator is always the same, no reversal being necessary to restore it to normal. The half revolution of the commutator is completed in thirty seconds, and by locating the segments on the commutators at the various stations at different points on the circumference it is possible to have the local circuit of the various stations closed in successive order, or according to any prearranged plan.

At the despatcher's office a master clock is installed which differs from those at the stations in that its commutator contains thirty segments on each half or a total of sixty, the ones diametrically opposite being connected in multiple. This commutator is stationary and contact is established with the segments by means of a revolving brush. The motion of this brush is controlled in the same manner as the commutators at the stations, and during a half revolution it makes contact consecutively with each of the thirty segments on the commutator and then comes to rest and is ready for the next call. Each of the thirty segments on the commutator of the master clock is connected to one contact of an individual key, the other contact of the key being connected to the winding of a local relay, its circuit being completed through the brush of the master clock. When operated this relay sends an electrical impulse out over the telephone line.

From this it will be seen that thirty individual keys are provided, one for each station. These keys when depressed are mechanically locked and are arranged so that when the master clock comes to rest after making a call all of the keys which have been locked are released and restored to normal. The despatcher is also furnished with a

* A paper read before the New York Telephone Society.

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starting key which when depressed sends an impulse of current out over the telephone line and starts the master clock and all of the station clocks, which continue to run for thirty seconds, being then stopped mechanically as previously mentioned.

To signal or select a station the despatcher depresses the individual key associated with the particular station desired and then starts the clocks by pressing the starting key. As the brush on the master clock passes over the segments on the commutator, and when in contact with the one connected to the station key which has been depressed, it completes the circuit of the local relay, sending a second impulse of current out over the line. At the instant this second impulse of current is applied to the line the brush and segment of the particular station desired are in contact and the locking relay controlling the signal bell being operated by the bridged line relay causes the bell to ring, which continues until the relay is released by the station operator pressing a key. No "answer back" signal is given to the despatcher, so that he is unable to tell whether or not the signal has been received until the operator answers. This arrangement permits of more than one station being called at the same time, in fact, it is possible to call all of the stations, if so desired, in the thirty seconds. The average time for an equipment of thirty stations would be fifteen seconds, which is greater than that of the system used by the New York Central and, further, while some stations can be called in three or four seconds, it will require twenty-six or twenty-eight to call others.

The great advantage which is claimed for the system used by the Burlington is the calling arrangement which permits one or all of the stations being called in one operation by the despatcher. It is believed, however, that this is not as important as one would imagine, as it is seldom necessary to call all of the stations, three or four being the usual number, and as it takes from one to five minutes to raise a single station by telegraph, and since with a selective device it is possible to call, say, three stations in twenty-four seconds, it is so great an improvement over the old method, a further gain of four or more seconds is not of any great importance. The multiple calling has a further disadvantage in that two or more operators are liable to come in on the circuit at the same time and break in on the conversation and cause confusion similar to that produced by telephone operators breaking in on a call circuit and in straightening out a situation of this kind more time is lost than is gained by calling several stations at the same time.

The New York Central system, taking eight seconds for calling each station, permits the despatcher to call one station and while instructing the operator at the first station to prepare to take an order, call the second station and while instructing the second operator call the third, the whole transaction taking about twenty-four seconds without confusion.

So far all of the telephone apparatus furnished for despatching purposes has been special and the indications are that this will continue for some time to come, as each railway official has ideas of his own which he naturally thinks are the best and which he will insist on trying.

In addition to the roads previously mentioned as actually despatching by telephone the following large roads are installing telephone despatching systems and expect eventually to operate by this system exclusively: Illinois Central, Lake Shore and Michigan Southern, Canadian Pacific, Chicago, Milwaukee and St. Paul; Chicago and Northwestern, Northern Pacific. Other roads, such as the Delaware, Lackawanna and Western, Erie, Baltimore and Ohio, Seaboard Air Line, Southern, Delaware and Hudson, Queen and Crescent, Pennsylvania, Michigan Central and Union Pacific are making investigations of telephone despatching and without doubt will shortly install such systems.

I find in looking over the Official Railway Guide that out of some 1,100 railroads operating 257,000 miles of track, 213 roads, or nineteen per cent., are operating their lines by telephone and have no telegraph connections whatever. The total mileage of these roads is 17,358, or six and three-quarters per cent., of the total railroad mileage.

BLOCK SIGNAL TELEPHONES.

A further use of the telephone in connection with the movement of trains is in connection with the operation of block signals. The usual method of communication between block signal towers is by means of telegraph or bell signals. Some roads are using the telephone for this purpose and have found it superior to either the telegraph or bell signals, as it enables more detailed information to be passed between the adjacent towers and movements of trains effected which was not possible under the old systems, and in this way facilitating the traffic and thus reducing the operating expense caused by delayed trains.

Of the various railroads approximately one hundred are using block signals, and of these seventy-seven are using the telegraph, sixteen the telephone and ten bell signals. About eight per cent., of the trackage operated is handled by telephone, two per cent. by bell signals and the remaining ninety per cent. by telegraph. The largest user of the telephone for this purpose is the Atchison, Topeka and Santa Fe, which operate their 1,800 miles of track by telephone exclusively. The Burlington is operating some 1,100 miles and the Illinois Central about 800 miles of track in the same way.

SIDING TELEPHONES.

On many of the western roads there are sidings located at some distance from the regular stations, and in come cases between stations, where trains must wait the passing of other trains. Telephones are located at these siding in booths or boxes on

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the poles, and the train crews report their arrival and the passing of other trains, to the nearest station and receive instructions governing their movements. This arrangement does away with the opening of many telegraph offices which would otherwise be necessary. Some railroads equip their trains with portable telephone sets, which may be used for this purpose or in cases of accident. In this case connection is established with one of the telephone or composited telegraph lines and the nearest station called.

* * * * *

An Old Telegram.

A telegram transmitted nearly sixty years ago necessarily bears the unmistakable marks of a venerable age. The "Toronto, Hamilton, Niagara and St. Catharine's Line," long since absorbed in the Great North Western system, was one of the first telegraph constructions in Canada. A message dated November 22, 1848, sent from London, Ont., to St. Catharines, over this line, was read at the recent convention of the railway telegraph superintendents at Montreal, and awakened interest, inasmuch as it was regarded as a relic and a reminder of the early days of the telegraph. This telegram has since come into the possession of Telegraph Age, being presented to the publisher by Mr. W. Marshall, of Toronto, superintendent of construction of the Canadian Pacific Railway Company's telegraph.

The contents of this old message are immaterial at this date. Doubtless, however, it was a family matter that brought it into existence, for the surname of the addressor and of the addressee were the same. Quite likely after this long interval of time, both have passed from earthly scenes, and this "telegraph" message, for the word "telegram" was then uncoined, in its resurrection is as mutely impassive in its forgotten correspondence, its faded ink and old-fashioned type, as the exhumed mummy of a remote age. But it is with the quaintness of the form and expression of the message blank that mainly arouses attention. The printed portion of the blank follows more a letterhead style than its modern prototype, a suggestion further strengthened by the fact that the lower part of the sheet is left free for the filling in of the written communication. Simplicity itself is reflected in this message blank. It bears no bustling official look; no binding conditions are printed thereon. It rather reflects, in its appearance, the moderation and tranquillity of method observed in its day and generation, when a dozen or two messages constituted a good day's business at any given point. Across the face of the blank is printed the "tariff of prices; from St. Catharines," which it seems were "for every ten words, to Toronto, Hamilton, Niagara Falls, Chippewa and Niagara, 1 3;" and "to Lockport and Buffalo, 1 10½." The presence of printed lines proclaiming "communications strictly confidential," and "communications delivered free of charge," would indicate in the one case a becoming desire on the part of the telegraph company to impress its patrons with the fact that a high sense of business morality governed its transactions, and in the other an early recognition of the services of the messenger boy.

"O. K."

A correspondent writing to a newspaper has this to say regarding the origin of "O. K.":

"I note what you say about the origin of the practice of using the letters 'O. K.' to signify 'Correct' or 'All right.' It seems to me that your informant is wrong. I am quite sure that this practice originated during the Clay and Polk campaign. At that time the writer was a boy, living in Booneville, Mo. You all know what a lively campaign the Clay and Polk campaign was. Mr. Clay was the idol of the Whigs, and was affectionately called 'Old Kentucky.' Those who favored his election put up their flags on ash poles, at all the crossroads, country taverns, and wood yards on the river, while the Democrats put up hickory poles with polk bushes at the top, the Whigs using for a flag a square of white cloth with the letters 'O. K.,' signifying 'Old Kentucky.'. The Democrats used a streamer with 'Polk and Dallas, Oregon and Texas.'

"The town of Booneville boasted two newspapers, one The Observer, a Whig paper, conducted by one Caldwell, a very brilliant young man, the other, The Booneville Register, conducted by one Ira Van Nortrick. Toward the close of the campaign the editor of The Register came out in a very salty editorial, denouncing the ignorance of the Whigs, and demanding to know 'What does O. K. mean, anyhow?'

"Caldwell came back at him with the information that he would find out that 'O. K.' meant 'Oll Korrect' in November. The expression took like wildfire; the boys yelled it, and chalked it on the fences. Like other slang, it seemed to fill a want, and upon the inauguration of the telegraph in 1846, the adoption of 'O. K.," I was informed by one of the first operators in the country, Mr. E. F. Barnes, was introduced to the business public, as he was one of the parties organizing the system of signals used by the company. Then it passed into general use. Of course, Missouri was not the only place where Mr. Clay was called 'Old Kentucky.' A favorite song of the Whigs, both in Missouri and Kentucky, only a line or two of which I can now call to mind, sung to the tune of 'Old Dan Tucker,' ran about thus:

"The balky hoss they call John Tyler,
"We'll head him soon, or bust a biler;
Chorus:
"So get out of the way, you're all unlucky;
"Clear the track for 'Old Kentucky!'"

If you are not familiar with TELEGRAPH AGE, a postal card request will bring a sample copy to your address.

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Composite Telegraph and Telephone System.

BY E. R. CUNNINGHAM.

The Interurban Railway, of Des Moines, Iowa, has worked out for itself a composite telegraph and telephone system which differs very materially from any other in general use, and has many features to recommend it especially for interurban despatching lines. The following description may be of interest to those who have occasion to operate despatching lines under similar conditions:

The system originally installed was intended for the telephone despatching of the cars on the Beaver Valley Division of the Interurban Railway. It consisted of No. 9 BB galvanized iron wires from Des Moines to Moran Junction, where the line branches, the branch line running four miles to Woodward, the main line twelve miles to Perry. The Perry end of the main line is thirty-six miles from Des Moines, and the Woodward end of the branch line twenty-eight miles from Des Moines. The telephone system was carried on standard cross-arms on the same pole and below the high-tension transmission line, and was transposed every ten poles by a transposition pin and insulator designed especially for this use. The telephones were of standard make and bridged on to the line in the usual manner, one being used at each station and passing point on the line. In all, there were fourteen telephones bridged onto the line. The despatching switchboard is located at the Des Moines end of the line, and is a fifty-line central energy board with ten lines now wired up, one of which is the Beaver Valley despatching line. Besides being used for despatching purposes, the latter line was also used for transmitting messages arising from freight, express, passenger and other departmental business. It was found necessary, therefore, either to build another telephone line for the commercial business or equip the present line with telegraph instruments to make a dual use of the one line. The latter plan was found to be much the cheaper, as it involved but a nominal expense for the telegraph instruments, and was adopted not only for that reason, but because it was thought to give a more extended and reliable service than two separate telephone lines. It would have been quite natural in adopting the telegraph system on this line to fall into the well-beaten path of American telegraph practice of connecting the telegraph instruments in series. To do this, however, necessitated the use of at least eight condensers cut in the telephone line.

Since both sides of the telephone line are used as one side of the telegraph line, it is necessary, at each intermediate telegraph station, to cut in a condenser in each side of the telephone line to open the line to the direct current telegraph current and cause it to flow through the telegraph key and relay.

In using the telephone it is necessary to signal and talk through these condensers, and while they do not interfere with the small undulating voice currents used in talking, they do seriously interfere with the signaling current, especially where there is a large number of telephone instruments bridged onto the line. Condensers are very delicate, and are an expensive fixture on a long despatching telephone line, especially where it parallels and is in close proximity to high-tension and power lines. They are so sensitive that they are continually being knocked out by lightning, induced static charges or stray currents from other lines. If this occurs and the condensers are not kept in proper order the telegraph current will interfere with the telephone service. To avoid the use of these expensive and troublesome condensers and to secure other very desirable results that will appear later, we decided to connect the telegraph instruments in multiple, more after the Continental or European telegraph practice than the American, the telegraph relay being cut in, between the neutral point of a suitably wound impedance coil, bridged across the telephone line and grounded through about 1,000 ohms resistance.

The telegraph key, which is of the open-circuit type (key without a closing switch), is cut in from some source of energy in multiple with the relay. As we have the 500-volt direct current circuit at each telegraph station, we connect the key between the fourth and fifth lamps of a series of five sixteen-candlepower lamps to obtain about 100 volts on the telegraph line. For the fifth or ground lamp we used four sixteen-candlepower lamps in series multiple, which have the same resistance as one lamp; but, being in multiple, there is no danger of the ground side of the series opening and thus throwing full potential on to the telegraph line.

The sounder is connected in the usual manner, either with a local battery, which in this case can be ordinary dry cells, as the sounder is on open circuit when not in use, or by shunting the ground light in a series of five incandescent lights in the same manner as power is obtained on the line.

All telegraph instruments on the line, when connected in multiple, are, of course, connected up exactly alike, and require but one impedance coil to each telegraph station and no condensers. They are all independent of each other, and any one of them can be cut on or off the line at any time by opening the double-pole knife switch.

Another advantage of the multiple system is that it is impossible for the operator to go away and leave the line open by leaving his key open. If the series system were used it would require two impedance coils at each intermediate telegraph station and two condensers. Another very important feature of the multiple system is that the neutral point of every impedance coil is connected to ground through the relay and about 1,000 ohms of non-inductive resistance. This in lines paralleling high-tension lines serves to carry off the static charges which otherwise would accumulate on the telephone line.

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It is a well-known fact that both sides of the telephone line sometimes act as secondaries to the high-tension line and that a high and dangerous accumulation of static electricity is induced on the telephone line. These impedance coils are so wound and connected that they act as impedance to the undulating voice and alternating current telephone signaling current flowing from one side of the line to the other, but do not act as impedance to current flowing from both sides of the telephone line to the ground. Therefore, the static or other stray currents of small volume but high potential can pass unimpeded from both sides of the telephone line to the ground.

On account of the sensitiveness of the telephone receivers to even a slight flow of current, they are very seriously affected by small induced currents from other lines which parallel the telephone line, especially from lighting, power and high-tension lines. It is important, therefore, to have a well-constructed telephone line. It must be perfectly balanced as regards resistance, impedance, inductance and capacity; that is, it must have the same resistance, impedance, inductance, and capacity in each side of the circuit. Not only must each side total the same, but it must have the same amount between each talking station. The line must be so transposed that each leg of the circuit shall occupy and travel in the same zone or position relative to other parallel lines and conductors half of the distance between each talking station. The line must be properly insulated, not only from all other lines, but from the ground, and all other objects having capacity which would unbalance the circuit by adding capacity to one side or the other.

The greatest source of trouble, and the one most difficult to overcome on telephone despatching lines, arises from two opposite and opposing conditions, both of which seem to be necessary—one for the operation of the line and the other for the protection of the same—from a dangerous difference of potential between both sides of the telephone line and the ground likely to be induced from the high-tension lines. A difference of potential of 300 to 400 volts will discharge across the protectors usually employed on the line, leaving the line safe, but not very serviceable, as the capacity of the grounded side is increased so as to unbalance the circuit and cause a continuous flow of current through the receivers on the line from one side of the circuit to the other, making the line so noisy that it is practically inoperative. These protectors or ground devices are usually carbon plates separated about 1/100 inch by perforated mica or celluloid, one being connected to one side of the telephone circuit and the other to the ground. When a discharge takes place from one carbon plate to the other it usually blisters it and leaves the line permanently grounded, and it is then necessary to go over the line and clean the protectors. Dust and dirt are also likely to collect in these protectors and ground the line with the same result.

Thus you are between the "devil and the deep sea" all the time. You must not let your line touch the ground, yet you must keep it within 1/100 inch of the ground in many places. It is from these two opposite and opposing conditions that nearly all the trouble on telephone lines paralleling a high-tension line arises.

Since the installation of the telegraph instruments on the Beaver Valley despatching line, most of the troubles mentioned have disappeared on account of the neutral point of the impedance coils being grounded and carrying off the static and other stray electricity which otherwise would accumulate, discharge across the protectors and blister them.

Since it is necessary to have a well-balanced line to prevent disturbances to the telephone from high-tension and other parallel lines, the use of the telegraph on the same line as the telephone does not necessitate any further care than would be necessary for any satisfactory operating telephone line.

A composite system not only doubles the amount of business than can be handled over a single line, but is much more reliable and convenient than either a telephone or telegrrph line alone, because the telegraph and telephone service are not subject to the same troubles. Although the telephone is more sensitive both to atmospheric disturbances and to induced currents from other lines, and consequently is less reliable than the telegraph, yet it is more convenient than the latter for handling a certain class of business, such as reporting cars at passing points and places where there are no operators, for reporting breakdowns, interruptions to service and all other kinds of business where it is necessary to get in close touch with the party addressed. In many cases quick action and an immediate response is required; nor does one wish to talk through a second party—the operator—when it is possible to communicate personally with the person wanted. There is sometimes a great deal of satisfaction in talking direct to the train crews, substation attendants, and other employes. For such work the telephone is most desirable, and for other cases, where one does not care for a personal interview a telegraph line has its advantages.

The great trouble with the telephone for despatching purposes is that the currents used are so small the lines will easily pick up foreign and induced currents from parallel circuits. Consequently the instruments are very noisy unless the line can be built to remain unaffected. Telephone transmitters usually operate on from two to four volts, and, as their resistance is from ten to twenty ohms, they will not transmit over about one watt. If a transmitter could be designed to handle, say, one hundred watts, then the receivers could be made less sensitive to currents from foreign lines, and they would not be affected by atmospheric conditions.

The composite system has all the advantages of both systems, with very little additional expense. It introduces no new troubles or complications and greatly diminishes the likelihood of a total interruption.—Street Railway Journal.

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The Military Telegrapher in the Civil War.

PART FIVE.—(Concluded.)

[The story related by John Lonergan, of Marysville, Kan., a military telegraph operator in the Civil War, of the part sustained by him in active army operations in the field during that period, printed from a letter written by Mr. Lonergan to Colonel William R. Plum, the historian of the military telegraphers, in 1878, so interestingly told in part in the June 16 issue of Telegraph Age, is herewith concluded.—Editor.]

In concluding this sketch I wish to revert to an incident previously overlooked by me. On the march to Chattanooga (1863) we extended the telegraph wire along the railroad, leaving the rails at Neck o' Jack cave and there ascending Sand mountain with our wire to connect it with the signal station on the crest under charge of Captain Batchelder. This signal station was in communication with six others. It was virtually a repeating station, keeping up and transmitting signals between the Twenty-first Corps moving along the north bank of the Tennessee river and the Twentieth and Fourteenth Corps on the south bank.

Our mission was to receive and forward such communications as were given us that could be reached by wire. It used to worry the signal officers to see us receive an eighty-word message in about three or four minutes that would take them an hour to send to destination by their system. The maintaining of communication by wire from Stevenson, Ala., to General Crook's headquarters at Maysville, Ala., was hazardous in the extreme. It was a long line of nearly fifty miles, running through the foothills of the neighboring mountains and close to the Tennessee river, and until the capture of the guerilla, Frank Gurley, we could but operate the wire during the day, for it was cut every night. When I first went to open up this line, I went on an engine with Captain Craig, quartermaster of the Second Cavalry Division, and Sheets, our citizen scout. At Woodville we were dropped into a culvert by a torpedo, and received a volley from the Rebels. Sheets had his ankle broken by the rail coming into the cab of the engine; the rest of us escaped all injury. It was then dark and a heavy rain-storm had set in. After a long discussion as how to reach Paint Rock Bridge, where we knew the Fourth Ohio Cavalry, under Major Patton, was stationed, it was decided that three operators should make the effort and get help for our beleaguered squad. Captain Craig, Conductor Hammel and myself volunteered to go. This undertaking was to me a dangerous exploit. For two miles we walked along the track, our only guide being an occasional flash of lightning that would light up our path and show us the track; yet we were glad when total darkness enveloped us, for we expected that at every flash of lightning we would receive a volley from some Rebel outpost. We were as near the Rebel command as we were of our own, but our greatest danger lay, however, in coming in sudden contact with our own troops.

In passing in Indian file through a long stone cut near Paint Rock Bridge we were challenged and ordered to halt, a summons to which I answered, "We have halted." I did not know whether the challenge came from our men or from the Rebels. Directly came the demand, "Who are you and how many?" Captain Craig replied three and unarmed. One of us was ordered to advance. I went forward, holding out both hands; in my right hand was my combination instrument.

As I neared the videt post the lightning flashed and revealed four men covering me with their guns. They commanded me to halt and desired to know what I held in my hand. I told them a telegraph instrument. They bade us come up closer. Realizing that I was telling the truth, they told me to call up my "pards." We were taken prisoners, but our captors were Union men. We were informed by the sergeant that five or six times he had ordered his men to level their carbines in our direction, intending to fire on us, and as often told them to recover arms. As we realized our narrow escape from death the sweat rolled off from us in great drops. A prayer of thankfulness was in our hearts for our deliverance. As only three hours previous to our coming this same squad had repelled an attack from the Rebel scouts in the same cut in which we were apprehended, it showed that we had approached old, tried and brave soldiers who never fired without knowing at whom. I opened my office in Major Patton's tent next morning, and sent word to General Crook, at Maysville, by Captain Craig, that I was ready for business, and would extend the wire to Maysville as soon as possible.

It was from Paint Rock Bridge that I sent the despatch from General Grant to General Sherman, by that prince of scouts, Corporal Pike, ordering General Sherman to move towards Chattanooga and abandon his line of communication with Memphis. General Sherman was keeping open communication with Memphis. He abandoned it and made forced marches in time to take a hand in the Missionary Ridge fight. The dangers that Corporal Pike passed through in bearing this message would make your hair stand on end. He made the trip most of the way in a canoe, and I think met Sherman's advance at Tuscumbia.

On the march to Atlanta my position most of the time was in the rear until the fall of that city. I was then assigned to General Gerrard, commanding the Second Cavalry Division. The line was ordered extended to Roswell's factory via Keys Cross Roads. Billy Patterson superintended its construction, but was halted when within five miles of Roswell's because of a Rebel advance. I remained with General Gerrard until assigned to General O. O. Howard, commanding the Army of Tennessee. The messages I used to send in cipher by scouts during the march from Pocataligo to Goldsboro were those giving information as to our progress and other details of our movements for the information of the general government at Washington. The scouts General Howard employed for this purpose were negroes.

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They proved a failure. Only our own soldiers were ever successful in reaching the fleet. The first communication we received by scouts from the outside world in cipher was from General Scofield. It was brought to us during the engagement near Fayetteville, N. C. The message was addressed to Charles Eddy.

Corporate Management Compared with Government Control.

BY ELIJAH W. SELLS.

(From an address delivered before the Society of Certified Public Accountants of the State of New Jersey, January 20, 1908.)

The position of the public accountant in respect to corporations and their management is always an independent one. Unlike the attorney he is not expected to make out a case. The character of the service he renders is impersonal. All he can do is to tell what the facts are, and they exist for his examination in forms so tangible and so subject to other scrutiny than his own that even if he were willing to prostitute his calling he would never dare to do so.

Our country just now is passing through a period of acute financial stringency. The securities representing its properties are selling at prices that range from thirty to sixty per cent lower than were obtained for them one year ago. The money needed to keep business going is harder to get to-day than was any sum, however great, for the extension and development of business one year ago, and the questions, What is the matter? How has this come about? Who is responsible? are on everybody's tongue. The answers that are so generously provided seem to me very wide of the mark. Usually they involve grave reflections upon corporate management, and usually they come from a class of people who are particularly glib with their tongue, or ready with their pen, and who seem to have no other qualification for throwing light upon so grave a problem.

We are told that the corporation managers are dishonest; that they "exploit" the people and their utilities; that they put their own enrichment above their duty to the stockholding interest or to the patronizing public; and that before there can be a return of the splendid prosperity we were enjoying, the corporation must be regulated and the government must step in with a sharp eye and a big stick.

My experience in the conduct of independent and impartial examinations of books of account and affairs has covered many years and has been concerned with the federal government, state governments, and city governments. It has covered the field also of railway, street railway, light, power, and other public service corporations. It has dealt with industrial corporations, the so-called "trusts." It has taken me into banks, trust companies, and insurance companies; into educational and charitable institutions. I think I may say it has taken me pretty generally over the whole field of public and private business, and if I am to judge by what my eyes have seen, it is the unassailable truth that almost any one of the men who stand at the head of our great business institutions is far more competent to run the government, and would run it more economically, more wisely, and more honestly than any of those who are in the business of running governments.

I know as a matter of fact that the management of our great properties is generally intelligent and economical, and that the management of our government bureaus is generally loose, irregular, and frequently dishonest; and when I read the articles with which so many of our newspapers and magazines are filled nowadays, reflecting on the men whose genius is developing the country's resources, and when I hear the proposals of politicians, from the most eminent to the least, for the passage of laws to hamper and restrict the energies of these men on the theory that their integrity is open to suspicion, my mind inevitably brings up the contrast that I always observe between a corporation's way of doing things and a government's, as disclosed by their respective records and books of account.

For the purpose of this comparison, incompetency and dishonesty need not be separated. Putting them together it is my deliberate estimate, that, judged, by the highest standards prevailing in the best conducted corporations, there is less than ten per cent of both among men in the management of corporations generally, and at least ninety per cent of both among public office holders, and I base this estimate upon my experience as a public accountant.

The men entrusted with the management of the corporations are better fitted to administer the affairs of such corporations and to exercise judgment in matters concerning both the investor and the public which takes their product or utilizes their franchises, than are those men who hold public office qualified to fill even their own positions, much less to undertake administrative control over corporations. The facts that prove this do not deal with the mere matter of honesty and efficiency. The organization of a public bureau is much less compact, much less harmonious in its operation than the organization of a great railway or a great industrial corporation.

The men at the head of such business organizations, in practically every case, are experts, working diligently, in harmony, and ready to work to the limit of their endurance, with full and direct control of their subordinates. On the other hand, nothing can be more notorious, the results are obvious to every public accountant who investigates, than the fact that in nine cases out of ten the head of a public department spends most of his time promoting his political interests, and the employes generally, protected by the civil service regulations, are looking to see how little rather than how much work they can get into their appointed short hours.—Concerning Municipal Ownership.

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The Filing Time Law in Maryland.

On June 30 the new law in Maryland which requires the time of filing to be placed on delivered copies of all telegraph messages, became effective. This measure according to those who were really responsible for its passage, was devised ostensibly as a means to prevent the mailing of telegraph messages at a time of strike. Its enforcement which in effect adds to the cost of sending a telegram, is arousing a storm of indignation and resentment. The people of Maryland evidently never imagined they would be called upon to pay for the extra words made necessary by placing the filing time on each message, otherwise probably an early protest would have been heard in opposition to a bill of this character.

The question, however, is to be tested as to its constitutionality by the Postal Telegraph-Cable Company. The attorneys for the company contend that the sender of the message, who alone is interested in the contract, has the right to waive the provisions in reference to the time file mentioned in the statute.

The statute requires that the office sending the message shall send to the receiving office the time the message was received at the originating office. Thus, if the message were received at 10.55 in Baltimore to be sent to a person in Frederick, Md., the operator in Baltimore would telegraph to the operator at Frederick the time the message was received in Baltimore. This, of course, would require extra words. Both telegraph companies are charging the sender for these extra words. The statute, however, does not require the company to send these extra words without compensation.

But the Postal company contends that the sender of the message can waive this provision, and in order to test the right of the sender to do so, this special case was sent to the grand jury at the instance of State's Attorney Owens and Mr. Howard Bryant, attorney for the Postal Telegraph-Cable Company.

On June 22 Mr. Bryant wrote to the attorney-general in reference to the matter as follows:

My idea as counsel for the Postal Telegraph-Cable Company is that the sender of the message has a perfect right to waive this provision, as to the time the message was received for transmission, because there will be an extra charge for sending to the receiving operator the time the message was filed for transmission.

For these extra words a charge would have to be made, which would have to be paid for by the sender of the message, consequently I hold that the sender, who alone is interested in sending the message and who makes the contract with the company, has a right to waive this requirement if he sees fit, because if he is deprived by the statute of this right, then the statute will be unconstitutional, as it will be an interference with the sender's right of contract.

I again hold that if the company must transmit these extra words, if the sender does not wish it and the public has no interest in the telegram, it also would be unconstitutional and beyond the police power of the state. It seems to me the matter can be satisfactorily solved in this way: That whenever the sender wishes to waive the right he can do so; in all other cases, there being no waiver, the statute stands.

Again on June 27 Mr. Bryant wrote to the attorney-general:

That inasmuch as the statute on its face seems to be mandatory it will be unsafe for my company not to transmit the time file and hence I am obliged to advise them to transmit it, the costs, of course, to be charged to the person sending the message. I feel, however, that inasmuch as the public, other than the sender of the message, has no interest whatever in having the time file transmitted, and inasmuch as the sender of the message is the only party who has the real right to insist upon it, hence he should have the right to omit it if he wishes to.

A test case should be made up at once, so that the court may determine whether or not the sender of the message must have this time file inserted in his message, whether he wants it inserted or not.

It is our contention that it would be an unconstitutional infringement upon his liberty of contract and property rights to compel him to pay for the transmission of the time file that he does not want transmitted, and that the public generally has no interest. In other words, I believe that he is entitled to waive it if he wishes, hence I suggest that we transmit a local message without the time file at the express request of the sender, and you, as attorney-general, or the state's attorney, will thereupon institute a case wherein we can test its constitutionality and ask the court for a quick decision. This we will do for the benefit of the public and not for our benefit, because as you can readily see, if the public must have the time file transmitted, we would receive that much more money on each telegram.

In consequence of the correspondence State's Attorney Owens had a case sent before the grand jury and the matter will come before the court for construction as early as possible.

The case was based on the following telegram sent in violation of the act:

John Doe, Frederick, Md.:

C. C. Huntzberry will file this message on account non-deliverv

W. W. Hellawell.

This message, it will be seen, bears neither the time of transmission nor the time it was received.

State's Attorney Owens, who is very much interested in the test of the constitutionality of the act, said that he was unable to arrive at anything like a logical idea as to its purport. He said that he could see no necessity for such an act.

The act, which was passed at the January session of the last Maryland legislature, and became effective on the last day of June, is as follows:

Section 1. Telegraph companies engaged in the business of transmitting communications by telegraph in the state of Maryland, and charging tolls therefor, shall show conspicuously on each and every telegram delivered the time it was filed for transmission and the time it was received at the office at which it is to be delivered.

Section 2. The time of filing the telegram at place of origin and the time received at destination of each and every telegram transmitted as provided in section 1 shall appear on each and every telegram under the caption "Time filed" and "Time received."

Section 3. Failure to comply with the provisions of sections 1 and 2 of this act shall be punishable by a fine of not less than $10 nor more than $200 for each and every telegram delivered in violation of said sections 1 and 2.

Section 4. This act shall be in force and effect on and after June 30, 1908, in accordance to the Constitution of the State of Maryland.

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The Military Telegrapher Should Be Pensioned..

Following the lead of the Republican party in its expression concerning pensions, adopted at its convention, commented upon editorially in our issue of July 1, the Democratic National Convention incorporated the following in its platform:

We favor a generous pension policy, both as a matter of justice to the surviving veterans and their dependents, and because it tends to relieve the country of the necessity of maintaining a large standing army.

It will be noted that the Republican plank is more ample and liberal in its expressions than the Democratic announcement. In both cases, however, there is ground for the belief that when Congress meets in December the military telegraph pension measure (Lorimer Bill—H. R. 175), which slumbers in the Invalid Pensions Committee of the House, or some similar measure, will receive favorable action and become law. We suggest, however, that to insure success each military telegrapher of the Civil War should make it his business to have his Congressmen, Senators and Representatives commit themselves to execute long-delayed justice to the small and fast-decreasing number of survivors of the corps whose members rendered such unique and important service to the country in its time of need.

Telegraphers' Mutual Benefit Association Notices the Death of W. H. Young.

At a meeting of the executive committee of the Telegraphers' Mutual Benefit Association, New York, held July 1, the following minute was unanimously adopted:

"The executive committee of the Telegraphers' Mutual Benefit Association records with deep regret the death of its late vice-president, William H. Young.

"Mr. Young became a member of the association in 1872, and since 1876 was a regular attendant at its annual meetings. He served continuously since 1879 as its agent at Washington, D. C. He was elected a member of the executive committee in 1881, and a vice-president in 1882. His devotion to the interests of the association was untiring and unselfish and his efforts contributed largely to the achievement of its present prosperous condition. By his death this association has lost a zealous member, a wise counselor and an able officer.

"This minute is ordered inscribed as a tribute to his worth as a member and officer, as a mark of the high personal esteem in which he was held by his association, and as an expression of condolence and sympathy with his family."

To fill the office of first vice-president, made vacant by the death of W. H. Young, of Washington, Charles P. Bruch, of New York, was elected. S. S. Garwood, of Philadelphia, was elected second vice-president, and W. J. Lloyd, of Chicago, to membership in the executive committee.

Reunion of Old-Time and Military Telegraphers.

Preparations continue apace for the coming reunion of the Old-Time Telegraphers' Association and the Society of the United States Military Telegraph Corps, at Niagara Falls, New York, on September 16, 17, 18. The programme of entertainment so far as definitely arranged was published in our issue of July 1. The affair gives every promise of being a most delightful meeting, and many are looking forward to its occurrence with more than ordinary interest because of its practically enforced omission last year.

Obituary.

G. M. Jarvis, superintendent of the Intercolonial Railway at Truro, N. S., died of heart disease on May 3. He was born in 1851 in Pittsburg, Pa. He began railroad work in 1868 as a telegraph operator on the Intercolonial, in which service he rose to the superintendency.

James L. Ritter, aged sixty-seven years, a well known telegraph operator, died at Butte, Mont., on July 2, after an illness of several weeks of erysipelas. The deceased was a native of Toronto, Canada, and was formerly chief train despatcher of the Chicago, St. Paul, Minneapolis and Omaha Railroad, at Mankato, Minn.

Dr. George Ewing Stuart, a former well-known telegrapher, died at Harrisburg, Pa., on June 17. From a messenger boy at Allegheny he became manager of that office. Subsequently he served as all night chief and finally as night chief operator in the main office at Pittsburg, holding the latter position when he resigned about January 1, 1895, to study medicine.

Richard G. Morris, a newspaper telegrapher who had worked on nearly all the New York newspapers, died in Bellevue Hospital, June 12, from an attack of kidney trouble. Mr. Morris was born in Columbus, Ohio, and he was fifty years old. He worked in the Cincinnati office of the Western Union Telegraph Company prior to 1880, when he transferred to the office in New York, in which city he had since been a resident.

Train Despatchers' Convention.

The convention of the American Train Despatchers' Association which met at Fort Worth, Texas, on June 16, 17 and 18, a reference to which was made in Telegraph Age in its issue of July 1, elected officers as follows: Vice-President Carl A. Mitchell, of Hartford, Conn., was made president; T. D. Dellmin, of Youngstown, O., vice-president, and J. F. Mackie, of Chicago, who has held the post for fourteen years, was re-elected secretary and treasurer. It was decided to hold the convention of 1909 at Columbus, O.

The following resolution was unanimously adopted, as has been the custom in previous years:

"We believe that the supreme aim of our association to be the elevating of its individual members

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to greater efficiency in the performance of their duty as train despatchers, and that this end can be best attained by excluding from consideration or discussion in any form all questions of hours worked, wages received or condition of the services required by the railroads of the despatchers in their service."

Morse Electric Club Outing.

The outing of the Morse Electric Club, of New York, bids fair to be an interesting event. It will be held as previously announced at the Cove Hotel, Livingston, West New Brighton, Staten Island, a favorite resort of telegraph excursionists, on Saturday, July 18. This being the first affair of the kind undertaken by this new club, the entertainment committee, consisting of P. J. Casey, M. H. Kerner and R. J. Murphy, have been at much pains to prepare an especially attractive programme for the pleasure of those who attend. In addition to this Colonel Clowry, president of the Western Union Telegraph Company, has placed the cable tug "Western Union" at the disposal of the club to convey the guests to and from the point of meeting. The steamer will make two trips, leaving Starin's pier, at the foot of Cortlandt street, at one o'clock, and at three o'clock. The club is officered as follows: J. B. Van Every, president; J. C. Barclay and B. Brooks, vice-presidents; F. J. Scherrer, secretary, and R. J. Murphy, treasurer.

NEW YORK, WESTERN UNION.

F. B. Giles, assistant chief operator, accompanied by his wife, together with H. C. Worthen, night chief operator, and wife, passed a pleasant vacation lately in North Carolina, visiting at the former home of Mr. Worthen.

Mr. H. O. Bannister, manager of the Western Union Telegraph Company at Raleigh, N. C., is the agent for Telegraph Age in Western Union circles at that place, and for the territory adjacent thereto. All who have business with this paper coming under this jurisdiction, whether those who wish to renew their subscriptions, those intending to subscribe or those wishing to purchase telegraphic or other electrical books, for which this journal affords every facility through its perfectly equipped book department, are invited to communicate with Mr. Bannister. He will attend promptly and properly to all requiremnts. Telegraph Age never before offered such an abundance of important, instructive and interesting matter as now. This paper is such an aid as to be invaluable to telegraphers.

Mr. G. W. Conkling, of the Laffan News Bureau, New York, was present as a representative of his company at the Democratic National Convention, Denver.

Why not familiarize yourself with the business methods of the Serial Building Loan and Savings Institution, 195 Broadway, New York? A postal card request will secure its literature. Financially sound, commended by the New York state banking department, it solicits your account and will gladly aid you in procuring a home under attractive and easy conditions of payment.

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Wheatstone Bridge, F. W. Jones .....Nov. 16, 1906
Wright Keyboard Transmitter and Printer, R. Hitchcock..Apl. 1, 1906

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Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

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Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

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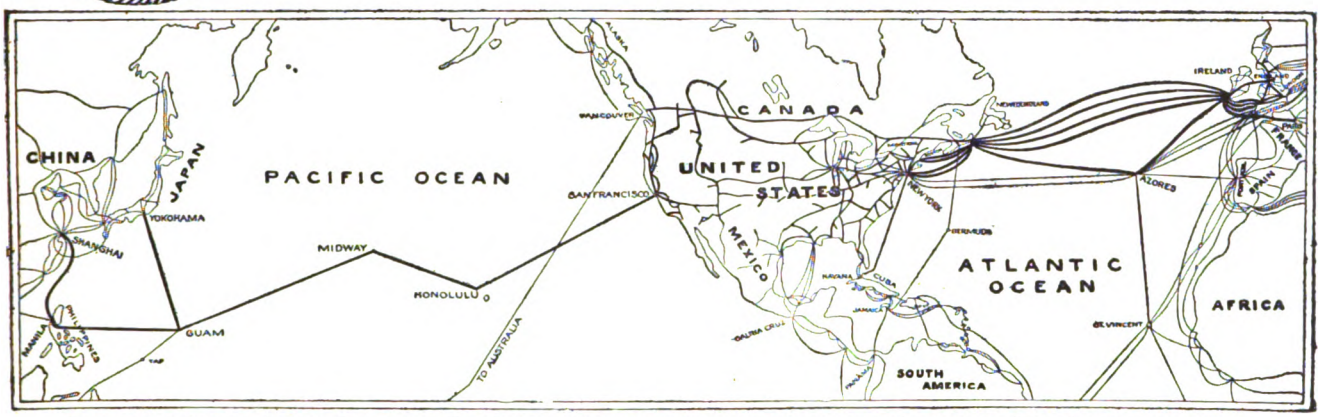

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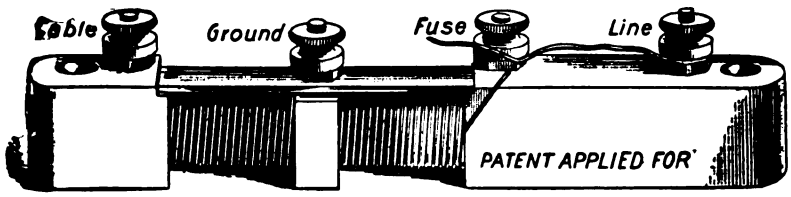

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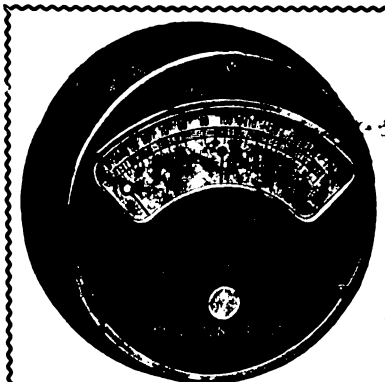

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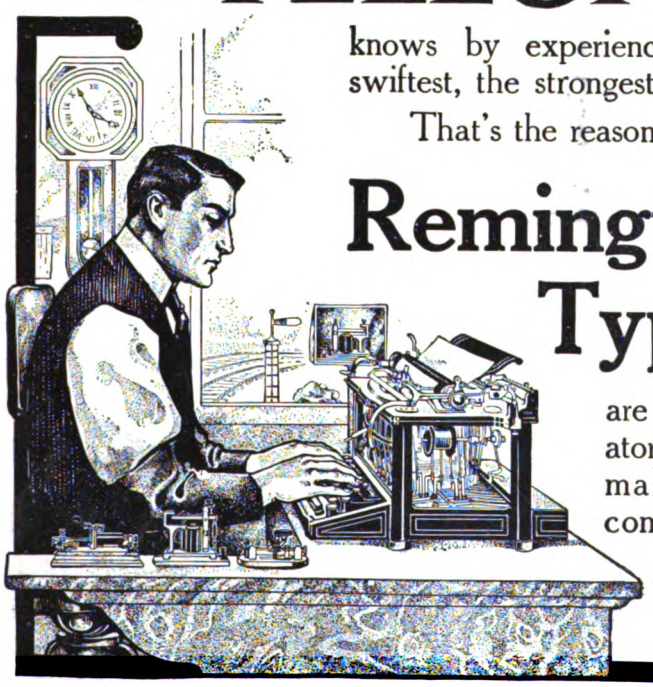

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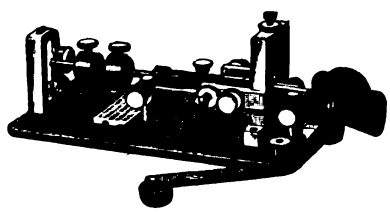

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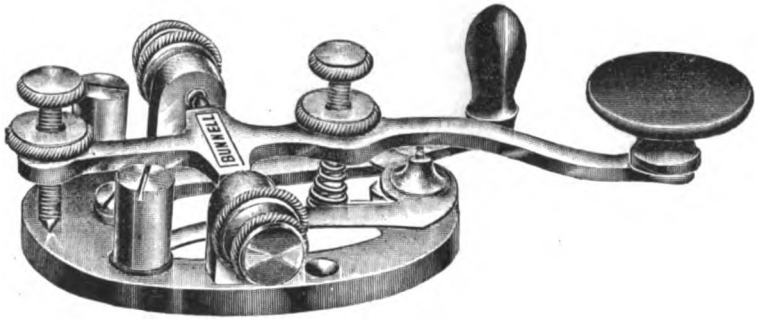

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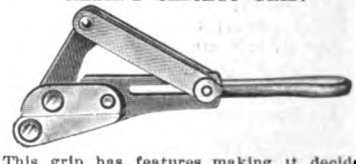

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SOME POINTS ON ELECTRICITY.

Duplex or Grounded Loop Interruptions.

BY WILLIS H. JONES.

The fact that duplex or grounded loops are subject to a greater number of interruptions than single loops seems inexplicable to the unenlightened, at first when such an assertion is made, yet no one who has ever had even a limited experience at a loop switch entertains the slightest doubt as to the accuracy of the statement.

Take a given number each of single and duplex branch office loops and note the interruptions occurring in each class for any stated period. It will invariably be found that the total number of interruptions to the latter, principally in the nature of temporary openings, will exceed that of the former by a very high percentage.

Of course, this fact is known in a general way and admitted, but its significance is often belittled much to the chagrin of the loop chief, who is usually called upon to explain delays due to these almost undetectable sources of interruptions. Notwithstanding such interruptions are eventually located, the source is usually difficult to find owing to their peculiar and varied natures. The ordinary lineman seeking the source of such an interruption has really nothing to guide him. His order usually consists of the stereotyped form, "Close receiving of loop No. 2 between Ax and Fx," and in many cases the loop "closes" long before he gets there. He has never served as a loop chief and in seeking trouble of this kind is often as ignorant of the true situation as the janitor in the basement, so far as the conventional form of his "order" enlightens him. It is a very simple matter for him to trace and repair an open break in a conductor, but not so easy a task to find the seat of an invisible equivalent of discontinuity; that is to say, find the location and source of a temporarily developed high resistance which causes a sounder to stand open while the local circuit itself is not actually broken.

Now, the purpose of this article is to call attention particularly to the necessity of loop and wire chiefs giving linemen more specific information as to the nature and possible seat of disturbances of this class when issuing an order, with a view of indirectly educating the fault-hunters by putting them wise to the actual situation. As a rule linemen assigned to this class of work are are not only willing but eager to acquire a better knowledge of their calling and if they are properly enlightened in the manner suggested, a higher degree of efficiency will naturally result.

As no one will probably disagree with the assertion in the opening paragraph of this article as to the preponderance of disturbances occurring in grounded loop circuits, the matter may be dismissed with the explanation that such interruptions, referring specially to that class called "mysterious openings," are undoubtedly due to the comparatively low voltage used on local circuits as measured by the main line pressures, and which obviously cannot compete with the latter in breaking down or overriding small obstacles which though harmless on long circuits are often fatal in short ones.

Disregarding interruptions due to the carelessness of operators in leaving their keys open and the legitimate breaks in the conductors, which should be alike common and probably equal in number in both single and grounded loops, we will endeavor to show how the seat of many perplexing disturbances may be easily disclosed.

DEFECTIVE FLEXIBLE CORDS.

A flexible green cord and wedge looks about as innocent and inoffensive, as long as it discloses no visible sign of a break, as the bulb of the electric light which sheds its glow on that most treacherous and deceptive of all paraphernalia. It will lie like a sinner and never change color; deceive like a wizard and apparently "prove it" unless one has been too long in the service to be caught in this manner.

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For instance, a loop is reported open. We cut in our test instrument and find it closed. Perhaps the moment we remove the test cord and wedge the loop again opens and later a second report is made. A repetition of the operation discloses no actual break and the natural inference is that someone may have had a key open temporarily. On a third complaint the cord is suspected, yet strange to say, the circuit cannot be reopened by any manner of twisting the cord, and again the natural inference is that the trouble was elsewhere. Finally on receipt of further complaints the loop chief, as a last resort, inserts an ammeter in the circuit at the desk before cutting in his test instrument and discovers that the circuit is not actually broken, but that a high resistance has developed and reduced the volume of current to such a degree that the sounder shows open. Of course, this fact may also be ascertained by holding the loop wedge in one hand and touching a big battery with the finger of the other hand. In a case like this the next move is to reinsert the loop wedge in its assigned spring jack and then press hard against the latter. If the sounder or transmitter at the multiplex set then closes, the seat of trouble is obviously in one of two places: in the cord wedge or the springjack, but in either case the opening is due to insufficient pressure against the wedge. The insufficient pressure in turn may be due to either of several causes; first, to a weak spring on the jack, or to a rusty hinge; second, to a shrinkage of the fiber underneath the brass blade of the wedge which results in an imperfect contact therewith; or, to a loosening of the wedge wrapper which permits the blade to withdraw from the fiber beneath it. Of course, the remedy is to either rip open the wedge end of the cord and rebind it, or remove and thoroughly overhaul the springjack, as occasion demands.

Now under identical conditions existing in a loop or a springjack a single loop would not open because the few ohms of additional resistance which such a fault would add to a long circuit would be so small in ratio to the normal resistance of the entire circuit that the normal volume of current therein would not be appreciably altered hence the defect would not be noticed. The same amount of resistance added to a built-up duplex loop of, say, 100 ohms' resistance, creates an entirely different ratio.

In addition to this particular defect in flexible cords they are often treacherous owing to a few broken strands which are only harmful when the angle at which the cord hangs is such that the strain withdraws them from contact with others which at other angles help to bridge over the break, and thus preserve continuity. Of course, this fault may readily be detected, as well as that of a loose connection at the socket binding post, fuse holder, and other points in the circuit, but the first mentioned defect—the "mysterious opening"—will continue to cause trouble until the importance of rebinding or changing suspected cords more promptly is realized. At present it is almost impossible to convince a branch office operator that a defect exists in his board of connectors as long as he "finds it closed" when he cuts in. In like manner linemen as a rule take no stock in invisible defects, or seek further for trouble that has "passed," yet in seventy-five per cent. of the openings reported the only way the loop can be closed is to request the branch office to cut in his test instrument at his board, and then when it closes patiently tolerate his stereotyped phrase: "Not here; was closed when I cut in!" This refers particularly to openings in the receiving leg of a loop.

Loop chiefs will all agree that the majority of openings of this class occur most frequently early in the morning and again soon after the exchanges close, thus suggesting either the absence of a wedge in the springjack in the morning, and the withdrawal of the same in the afternoon when the operators come down from the exchange floor. In each case a diminished tension of the spring on the jack is usually the seat of the trouble.

When such interruptions occur frequently in one office the signs of the difficulty are plain and instead of arguing the matter the cords and springjacks should immediately be thoroughly overhauled.

Recent Telegraph Patents.

A patent, No. 893,115, for an automatic vibrator for telegraph keys, has been issued to Frank T. Vail, of Minneapolis, Minn. A pendulum having a contact is supported by a frame so as to oscillate and close the telegraph circuit with a regular frequency for transmitting dots or dashes. Means are provided by which its effective length is changed when dots are transmitted.

The following patents have expired:

Patent No. 455,320, for a telegraph key, held by R. W. Green, of St. Thomas, Canada.

Patent No. 455,398, for quadruplex telegraph, held by F. D. Haskins, of Brooklyn, N. Y.

Patent No. 456,110, for automatic circuit closer for telegraph keys, held by J. W. Brown, of Van Wert, O.

Mr. F. E. Milligan, president of the National Telegraphone Company, Rochester, N. Y., in a recent letter renewing the subscription of his company to Telegraph Age, writes: "We consider Telegraph Age one of the best papers of the kind published, in fact the only one that gives full information in regard to the telegraph situation the country over. We will gladly take advantage of any opportunity to recommend it."

TELEGRAPH AGE has helped many a telegrapher in his career. It will help you. Price, $1.50 a year. Send for a free sample copy.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Continued—Part 4.)

THE PERFORATOR—CONTINUED.

The punch block (29, Figs. 7 and 10)* is furnished with die, stripper and guide in which the twenty-five punches (eight upper, nine center and eight lower) move in perforating the tape. Lugs are so disposed on the various punches that the center group while not brought into direct contact with the punch levers, is carried forward with the movement of the latter and a middle row of holes is thus formed in the tape simultaneously with the upper and lower perforations.

There are three paper guides or idlers; one fixed (31, Fig. 7), one flexible (32) and one adjustable (32a). The latter, which is close to the punch block, is used for so regulating the height of the tape that the center row of perforations will be equidistant from the edges of the tape.

An indicator glow lamp (44, Figs. 7 and 9) to show when the limiting number of seventy-five characters has been prepared on a line, is operated by means of a worm (42) which is placed on the cam shaft, and engages a gear on which is mounted a pointer as well as an insulating disc with a metallic segment on its periphery. After about sixty letters have been punched, this metallic segment makes an electrical connection with a small brush through which a current flows into the lamp, the illumination of which serves as a warning that the end of a line is approaching. The pointer is reset to zero by pressing the indicator key (43, Fig. 7) of the keyboard which throws the gear out of engagement with the worm and permits the indicator to return to the normal position under the influence of a small flat-coiled spring.

The correct manner of starting the tape in the machine is to first place the paper roll on its reel so that it will unroll anti-clockwise, then thread it around the idlers or guides and through the punch block to the feed wheel. Next turn on the motor, and having knocked down such selector pins as may happen to be in the way of preventing the feed wheel from running freely with the motor, press the steel idler (52, Fig. 10) back from the feed wheel, and push the tape on to the wheel, which, while turning, will split the tape and carry it far enough forward to lay hold of with the fingers. Now release the spring barrel clutch by pressing back its key (39, Fig. 14), making sure that the pin of same is in one of the series of holes with which the spring barrel disc is provided. A pin in the feed wheel should be set up, and the spring barrel clutch released, after which (still keeping hold of the tape) a few of the key levers should be successfully struck, the effect of which will be to bring the tape out on to the feed wheel. Finally turn the feed wheel idler around until it bears upon and holds the tape in contact with the feed wheel, and tear off the tape so that it may enter the chute and pass through the guide in front of the tape box and message desk (41, Fig. 7).

The various parts of the new perforator will be known officially by the numbers and titles given them in the following

TABLE OF REFERENCES.

No. 1, key buttons; No. 2, key levers; No. 3, punch bars; No. 4, feed bars; No. 5, universal bar; No. 6, universal bar fork; No. 7, second universal bar; No. 8, punch bar links; No. 9, punch bell cranks; No. 10, punch levers; No. 11, feed bar links; No. 12, feed levers; No. 13, feed cross levers; No. 14, universal bar hook lever; No. 15, clutch lever release and locking lever; No. 16, clutch lever; No. 17, motor gear; No. 18, idler gear; No. 19, idler gear; No. 20, idler gear; No. 21, clutch gear; No. 22, fixed cam; No. 23, cam shaft; No. 24, feed cam; No. 25, punch cam; No. 26, feed cam lever; No. 27, feed bail; No. 28, punch bail; No. 29, punch block; No. 30, punch returning bail; No. 31, tape idler; No. 32, tape idler; No. 32a, punch block idler; No. 33, knock down arm; No. 34, feed wheel; No. 35, feed wheel pins; No. 36, spring barrel shaft; No. 37, spring barrel clutch; No. 38, clutch ring cam; No. 39, spring barrel clutch release; No. 40, motor; No. 41, tape box and message desk; No. 42, indicator worm and gear; No. 43, indicator key lever; No. 44, indicator lamp; No. 46, clutch lever roller; No. 47, spiral gears; No. 48, feed spring with leather shoe; No. 49, spring barrel disc; No. 50, spring barrel; No. 52, feed wheel idler; No. 54, feed lever roller; No. 55, feed pin limiting stop; No. 56, flat bow spring; No. 57, knock down arm containing tube; No. 58, knock down adjustable spring; No. 59, feed wheel stop.

(To be continued.)

* The figures referred to in this installment will be found in the July 1 issue of Telegraph Age.

Personal.

Mr. Dennis F. Brown, of the Washington staff of the Western Union Telegraph Company, will take part in a competitive drill of the uniform rank, Knights of Pythias, at Boston, the first week in August.

Mr. Charles A. Tinker, of Brooklyn, former general superintendent of the eastern division, Western Union Telegraph Company, and Mr. James Merrihew, of Claverack, N. Y., who was associated with Mr. Tinker in the Western Union service, as general superintendent of the southern division, are off together up north on a fishing vacation.

Mr. W. N. White, of Covington, Tenn., a well-known old timer and a member of the United States Military Telegraph Corps, although recently having suffered a stroke of paralysis, from which, however, he has largely recovered, announces his intention to be present at the reunion at Niagara Falls on September 16, 17 and 18, if the state of his health at that time will permit.

Mr. A. L. Tinker, who for the past eight years has represented the Gamewell Fire-Alarm Telegraph Company in Berlin, Germany, in which country he has been successful in establishing his company's business upon a firm and permanent basis, has returned to make his home in

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his native land, and in future will reidentify himself with the New York office. Mr. Tinker is a son of Charles A. Tinker, former general superintendent of the eastern division of the Western Union Telegraph Company, New York.

Alexander Graw, an old-time New York telegrapher, who holds the position of claim agent of the Baltimore and Ohio Railroad Company, at Youngstown, Ohio, was a recent New York visitor.

Mr. Frank L. Dyer, attorney for the various Edison companies, at Orange, N. J., has been elected president of these allied interests, and Mr. Carl Wilson, general manager, in place of Mr. William E. Gilmore, formerly occupying both positions, resigned.

Mr. S. H. Riker, district plant chief of the American Telephone and Telegraph Company, Troy, N. Y., was a recent visitor in New York, and took occasion to call upon many of his friends. Mr. Riker was formerly and for many years connected with the telegraph service at Syracuse, N. Y.

Mr. Harry C. Wilson, superintendent of the government telegraphs at Kingston, Jamaica, is spending his vacation in this country, dividing his time mainly between New York and Boston. Mr. Wilson is a brother of Arthur Wilson, of the Commercial Cable Company, New York, and of Frank Wilson, of Boston, formerly superintendent of the same interests at that point.

Dr. L. M. Rheem, of Minneapolis, the well-known physician and old-time telegrapher, whose frequent communications to Telegraph Age have always interested a large circle of readers, has abandoned the practice of his profession to engage in mining. As president of the New World-Lincoln Consolidated Gold and Copper Mining Company in Montana, the good doctor will delve into the earth, seeking reward in rich hidden treasure instead of ministering to the sick, as he has so successfully done in the past.

Le Taotai Chow Wan Pang, vice-director-general of the Chinese telegraphs; F. N. Dresing, foreign advisor to the Chinese telegraph administration, and Mr. Yung, traffic superintendent of the Chinese telegraphs, all of Shanghai, and members of the Chinese delegation to the International Telegraph Conference, lately held in Lisbon, were recently in New York. While in the city these gentlemen were entertained by Clarence H Mackay, president of the Commercial Cable Company, and also by L. G. Martin, the cable and telegraph expert of the Okonite Company. The visitors sailed on their homeward voyage from San Francisco on July 23, on the steamer Korea.

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Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Charles C. Adams, vice-president, who went to Denver, to look after company interests, during the week of the convention, was enthusiastic in his praise of the work accomplished. He stated that he never before saw so many expert senders assembled in one city. Every man who was entrusted with a key appeared to be a star of the first magnitude. Mr. Adams not only praised the local Denver force, but also those who were assigned to that point from other places to help out during the rush. Mr, Adams is now absent on his vacation and will spend his time on the New England coast.

Mr. Edward B. Pillsbury, general superintendent of the company, has had conferred upon him by the University of Maine, his alma mater, the degree of bachelor of science. Mr. Pillsbury was one of two selected for this honor out of a list embracing 1,500 names.

Mr. F. E. d'Humy, assistant electrical engineer, is rusticating at Petersburg, N. Y.

Mr. Morisaburo Tonegawa, of Tokyo, electrical engineer of the Department of Communications of Japan, who is in this country on a tour of telegraph inspection, was a visitor recently at the office of Minor M. Davis, electrical engineer of the company. Mr. Tonegawa was interested in making an examination of the Rowland printing telegraph system.

Mr. S. B. Haig, traffic manager, after completing his special work at Denver, occasioned by the recent convention, extended his trip to various other cities in the Western division, visiting them in his official capacity for the benefit of the service, has returned and is once more at his desk.

Mrs. H. A. Tuttle, of Minneapolis, wife of Vice President and General Manager Tuttle of the North Telegraph American Company, was a recent visitor to the operating department under escort of General Superintendent Pillsbury, and was much interested in the operation of the Rowland system.

RESIGNATIONS AND APPOINTMENTS.

Mr. F. N. Roberts, for many years affiliated with the head of the operating department at Chicago, has been appointed chief operator of that office, vice J. E. Pettit, resigned.

Mr. Earl W. Miller has been appointed chief operator at Philadelphia, vice Geo. W. Dunn, who has been transferred to the traffic department, and P. McElroy has been appointed assistant wire chief.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Among the executive office visitors recently were I. McMichael, of Toronto, Ont., vice-president and general manager of the Great North Western Telegraph Company; Jacob Levin, general superintendent of the Southern division of the company, and J. S. Calvert, assistant superintendent, of Atlanta, Ga.; T. P. Cummings, manager, at New Orleans, La.; Thomas F. Clark,

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chief operator at Boston, and George A. Burnett, of the Great Northwestern Telegraph Company, Buffalo.

The many friends of Allen C. Woodle, manager at Boston, learned with much regret of the drowning of his son Henry, aged thirteen years, while in bathing at Melrose, Mass., on July 21.

RESIGNATIONS AND APPOINTMENTS.

Miss Mary Littell has been appointed manager at Lake Charles, La., vice A. O. Boudreaux, resigned.

The Cable.

Mr. E. Grigg, superintendent of the West Indies and Panama Telegraph Company, at St. Croix, W. I., is in this country on a vacation, reaching New York, July 22.

At a recent meeting the New York Chamber of Commerce adopted a petition, prepared by the committee on foreign commerce, to the State Department asking that the matter of better protection for the transatlantic cables be taken up by the British Board of Trade.

Cable communication was interrupted July 28 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzorote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

The English Postmaster-General has appointed a committee to inquire whether injury is caused to submarine cables by the operations of trawlers; and, if so, to consider and report what steps it is desirable and practicable to take to prevent such injury. The Chairman is Sir J. C. Lamb, C.B., C.M.G. Mr. F. J. Brown, of the secretary's office, general post office, will act as secretary, to whom all questions of evidence should be submitted.

Municipal Electricians.

A patent, No. 893,125, for a selective signaling system, has been granted to Garrison Babcock, of Chicago. A selective ringing system for party lines has means for sending selective impulses over the line to polarized electromagnets at the sub-stations.

The International Association of Municipal Electricians will meet in annual convention at Detroit, Mich, on August 19, 20 and 21. The following papers will be read on the occasion: "Combination Cables for Fire and Police Signal Systems;" "Moving Picture Hazard;" "Batteries for Signaling Systems;" "Testing for and Locating Faults in Electrical Transmission Lines;" "Electrical Equipment of a Fire Station;" "Modern Police Signal System."

"Pocket Edition of Diagrams," etc., by Willis H. Jones, electrical editor of TELEGRAPH AGE, embodies more practical information concerning the telegraph than any book or series of books hitherto published. See advertisement.

Radio-Telegraphy.

The United Wireless Telegraph Company has established a wireless station at the Ten Eyck Hotel, Albany. This adds another to the hotel chain of this system which now includes the Plaza and Waldorf-Astoria in New York, and the Bellevue-Stratford in Philadelphia. The company will also similarly equip the boats of the Hudson River day and the Albany night line steamers.

In a recent interview with a representative of a London daily newspaper, Mr. William Marconi stated that he has lately been experimenting with duplex wireless telegraphy. The experiments, he said, were quite successful over a distance of three or four miles. He anticipates equal success over the Atlantic Ocean before long. The present speed of transmission across the Atlantic, in one direction, is twenty-four words per minute. He also referred to another of his recent experiments. Its object is to enable a ship approaching the shore, or another ship in a fog, to determine exactly the position of the wireless station on shore, or the course of the other ship.

In future the United States Signal Service will include in its equipment a device embodying complete wireless telegraph outfits, which will be carrried on the backs of two mules. The device has been perfected to such a degree that operators can begin sending messages within a half minute from the time the mules are stopped and the packer begins to unload the outfit. The device is to be tried for the first time in the Far West, under the personal direction of Colonel Richard E. Thompson, of Seattle, Wash., the chief signal officer of the department of the Columbia. The kit consists of receivers, transformers and a one-eighth kilowatt generator. There is also a small telescope pole, which by means of hidden springs can be erected to a height of sixty feet in the air, with all the necessary wires and appliances connected in the fraction of a minute. The difficulty found in the device in previous trials has been that it was not powerful enough to send or receive messages for distances greater than eight or ten miles. New methods and slight changes will be tried by Colonel Thompson, and it is hoped that the communicating distance can be increased to fifteen miles.

Mr. N. E. Smith, superintendent of telegraph, of the New York, New Haven and Hartford Railroad, New Haven, Conn., has this to say respecting Telegraph Age: "I beg to hand you herewith check covering renewal of my subscription to Telegraph Age, and to say that if the journal cost ten times as much as it does, I should be amply repaid in subscribing for it. I look forward to its periodic coming and should feel lost without it. It is a publication full of valuable and interesting information and I trust that your subscription list will be increased a hundred-fold during the coming year. I am glad to add my simple testimony to its value."

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To Perpetuate the Society of the United States Military Telegraph Corps.

Like the Society of the Cincinnati, established in 1783 to perpetuate the friendship of the surviving officers of the Revolutionary Army, the Society of the United States Military Telegraph Corps, has provided means for perpetuating the latter organization. The United States Military Telegraph Corps of the Civil War was organized into a society in 1882, its first reunion taking place at Niagara Falls, in September of that year. As there are now less than two hundred survivors of the Civil War corps it was realized that something should be done to perpetuate the society. Accordingly an amendment to the constitution was proposed by D. H. Bates, at the reunion of 1905, held at the Waldorf-Astoria, New York City, but it was not finally acted upon until recently.

The following is the text of Article VI. so far as it refers to the matter:

"All persons of good standing, who were members of the Military Telegraph Corps at any time from the beginning of the War of the Rebellion to the disbandment of the corps, and the sons and male descendants of such members, shall be eligible to membership in this society."

Already quite a number of sons have received their certificates of membership in the society and additional applications are being received frequently.

All applications should be addressed to the secretary, Mr. D. H. Bates, 658 Broadway, New York City.

The Military Telegraphers and Telegraph Age.

No body of telegraphers are held in higher esteem than those who in their professional capacity served army interests actively in the field during the Civil War. Their deeds were influenced by motives of patriotism, and furnish many fine examples of intelligent performance, self abnegation and heroic devotion to the cause in which they were enlisted. To promote the welfare of these men, whether regarded as individuals or as component parts of the Society of the United States Military Telegraph Corps, has ever been the purpose of Telegraph Age. Many of these military telegraphers are subscribers to this journal and those who are not are missing a good deal they would like to know, for the paper prints much that is of value and interest to them, both in reminiscent matter of valorous deeds performed in the army and in urging of government measures calculated for their benefit. Moreover, much that is of current interest respecting the organization finds a place in these columns; in fact, there is something in every issue that appeals to the consideration of these military telegraphers, and the hope is expressed that each one may deem it to his advantage to place his name on our subscription list and so receive the paper regularly.

Bargains in Books.

The following list of electrical books, standard in character, are offered at a bargain price—twenty-five cents apiece. They will be sent to any address on receipt of a quarter of a dollar, carrying charges to be collected. The volumes, while a little shopworn, are otherwise as good as new, and at the low figure offered afford an excellent opportunity to secure valuable library additions for a very small sum. Address in ordering J. B. Taltavall, Telegraph Age. 253 Broadway, New York. The offering includes:

Four volumes of "Telegraphy," by Preece and Sivewright; two of "Electricity Made Easy," by Houston and Kennelly; two of "Telegraphers' Hand Book," by Flegel; four of "Patented Telephony," by Amn. Elec. Eng. Assn.; three of "Telegraphists' Guide," by Bell; one of "Street Railways," by Fairchild; twenty-two of "Manual of Diagrams," by F. W. Smith; four (board cover) and five (cloth cover) of "Handbook of the Electro-Magnetic Telegraph," by Loring; two of "Gleanings," by Booth; two of "Electro-Plating," by Trevert; one of "How to Become a Competent Motorman," by Livermore; two of "Incandescent Lamp," by Randell; one of "Metric System," by Hartford Steam Boiler Insp.; one of "Arithmachinist," by Goldman; one of "Dynamic Electricity;" one of "Electric Lighting," by Morton and Anderson; one of "Electric Telegraph," by Sabine; one of "Electricity—100 Years Ago and To-Day," by Houston; one of "Electricity Up-to-Date," by Verity; one of "Dynamo Construction," by Urquhart; one of "Telephone Service," by Webb; one of "Synopsis of Current Electrical Literature," by Osterberg; one of "Mossman's Code;" one of "Evolution of the Electric Incandescent Lamp," by Pope; one of "Laboratory Manual of Electro-Therapeutics," by Herdman and Nagler; one of "Electricity and Electrical Engineering," by Fiske; one of "Mechanical Art Simplified," by Dixon.

Professor Dolbear.

In the tranquil evening of his life Professor Amos E. Dolbear, a scientific seer, some of whose visions have become material facts, although he has not reaped the material reward, still keeps in touch with the great problems of physical research in which he is no longer able to take an active part.

Somewhat broken in health and unable to do laboratory work or to write except with great difficulty, Professor Dolbear spends most of his time in reading or in converse with friends whom his scientific attainments and the charm of his unaffected and simple manner gather round him. The best years of his life have been devoted to Tufts College, to which his fame has attracted hundreds of ambitious students, and yet when the time for his retirement came the college was too poor to continue his salary. The chief source of his income is the Carnegie pension fund.

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Morse Electric Club Outing.

The Morse Electric Club achieved distinction by its initial outing celebrated at Cove Hotel, Staten Island, on the afternoon and evening of Saturday, July 18. It was a Western Union demonstration. In addition to the local contingent, who turned out most loyally, there were also present a number of representatives from out of town, besides numerous friends. Altogether about one hundred and fifty persons enjoyed the hospitalities of the occasion so freely extended. The cable tug "Western Union," which had been placed at the disposal of the committee by the kindly action of Colonel Clowry, made two trips to the island, at one and three o'clock, respectively, conveying club members and their friends direct to the grounds.

Belvidere Brooks, general superintendent of the Eastern division, who also attended the outing, made the trip down in his yacht "Wacoutah." He had with him as his guests J. B. Van Every, M. T. Wilbur, William Holmes, A. G. Saylor, J. C. Willever, F. E. Clary, F. J. Scherrer, Lawrence Barnum, W. Pullen, W. N. Fashbaugh, Joseph Brooks and R. J. Murphy.

The weather was delightful, and the athletic sports, in varying form, which were the features of the occasion, were very generally participated in. The entire party seemed to be out for a good time, and manifestly secured the object of their quest. A game of baseball played between two picked nines proved to be the event of the day. The spectators who lined up to witness the exhibition of skill displayed by the experts engaged, observed much to stimulate thought, kindle imagination and arouse hope, as well as to excite amusement, for it must be admitted that much that was comical occurred to punctuate the work of the men at the bat and in the field as the game progressed. The demonstration proved, even if many of its participants had sore bones and experienced tired feelings for several days thereafter, borne in sad reminiscence of the affair, that telegraphers are a versatile folk, if not equally proficient at the bat as at the key, then —well, nearly so. To say that Belvidere Brooks and A. G. Saylor umpired the game, put at least a kind of official decision on the rulings rendered, being accepted as "for the good of the service," thus fortunately shutting out all discussion, notwithstanding some rank decisions unhesitatingly given on balls and strikes. Close observers noticed that the foreign element, so-called, engaged in the game, because of their peculiar alertness and prodigious efforts, were apparently keenly solicitous to guard the good name of the respective localities from which they hailed. It was therefore no wonder that whenever T. P. Cummings, manager of the New Orleans office, came to the bat he made a home run. Atlanta, Ga., was not to be outdone by the Crescent City, and its representative, J. S. Calvert, the assistant superintendent at that point, frequently lambasted the ball all over the twenty-acre field. So, too, was the valor exhibited by W. H. Spry, manager of the Newark, N. J., office, for he had his revenge on old-time associates whenever he had the opportunity to put players out. The work, both in the field and at the home plate of Captain Thomas F. Clark, the popular chief operator of the Boston office, was of such a character that it was easily discernible that this savant of Eastern civilization possessed a very limited acquaintance with the national game in all of its details. This was illustrated when one of the New York chief operators, taking exception to a feature of the play, ventured to dispute the point with the worthy captain, when the latter was heard to remark with a fine assumption of authority at once indicative of superior knowledge, that he would have his way, or he would have the kicker removed from the "eastern switch" on his return to telegraphic work.

The unwonted excitement aroused by the game was responsible, it was said, for the bold exclamation attributed to Charles H. Murphy, of the time service, usually so mild mannered, to the effect that whether or not his clocks ever went again, he would punish those who endeavored to stop the balls that received momentum from his bat.

On the other hand, Frank J. Scherrer, more phlegmatic in temperament, and perhaps because of his diplomatic training, preserved a more nearly even poise, and took no chances of getting his temper ruffled or of bruising his fingers. In fact, with rare good judgment, he selected the easy position of right field and then skilfully and with wonderful composure of mind, utilized the services of an umbrella to catch the balls that came his way.

The tall form of M. J. O'Leary was seen speeding around the field with a tense and expectant look on his face as though he expected to seize in eager grasp a bunch of Telegraph Mutual Benefit applications at every base. He, however, was doomed to disappointment, for like missing the elusive fountain of youth, Mr. O'Leary failed to reach his goal. While it is claimed by some that Gardner Irving distinguished himself on this hard fought battlefield of the ball, truth compels the statement that his habit of knocking a score or more of foul balls every time he presented himself at the bat, was a source of irritation to the umpires.

There were other New York players who gallantly took part in this memorable ball game, an achievement the recollection of which will go down through the ages. Among them were: Harry P. Dunn, D. L. Doran, J. F. McGuire, Lawrence Barnum, George Messner, William Merley, J. A. Dierks, Frank Fitzgibbons, J. P. Riley, Harry Durland, C. F. H. Johnson, W. Pullen and A. M. Lewis.

At the conclusion of the first inning a number of the players, beginning to show signs of exhaustion at the unwonted exercise, cast about for substitutes, offering liberal sums for any who would take their places and finish the game. No

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payment however alluring in amount could tempt anyone present to step in and change existing conditions, for those watching the sport were deriving too much merriment from the scene they were witnessing. Special efforts were made to induce C. B. Dunham, manager of the Canso, N. S., cable station, who was an interesting spectator, to take part in the game, Mr. Dunham, however, was not to be persuaded, thereby exercising excellent judgment, as is his custom in an emergency, and continued to remain seated on the uppermost row in the grandstand. Another gentleman who with great difficulty resisted the efforts to induce him to take part in the field, was Mr. John C. Willever. Mr. Willever evidently had in view the desirability of resuming his official duties in the executive offices on the following Monday, rather than to take any chances of being obliged to resort to arnica and bandages.

Besides the umpires the next best abused man was the scorer, Edwin F. Howell, secretary of the Serial Building and Loan Savings Institution. It appears that he did not register runs fast enough to suit some of the players, and when he announced that the game had been won by the winners by a score of 16 to 14, many declared it would be Mr. Howell's last chance at a score card.

After the excitement due to the ball game had in a measure quieted down, running races were indulged in with results quite as grotesque as in the field game. A special fat men's race was announced between Belvidere Brooks and H. L. Shippy. It was generally admitted that Mr. Brooks crossed the line first, but in order to preserve, it was said, the *entente cordiale*, the first prize was generously awarded to Mr. Shippy, just to prove that no hard feeling existed between telegraph officials and manufacturers of iron and copper wire. A second fat men's race that enlisted much enthusiasm followed the notable performance of Messrs. Brooks and Shippy. This resulted in the first prize being awarded to William Marshall, of Condenser fame; the second to Judge J. T. Laidlaw, head of the Barclay printing telegraph department, and the third to M. J. O'Leary, secretary of the Telegraphers' Mutual Benefit Association. Still other interesting races were won by William Merley, J. P. Riley, A. M. Lewis, Thomas F. Clark, of Boston; R. J. Murphy, W. A. Schuck, Joseph Connolly, B. H. Reynolds, Harry Durland, C. F. H. Johnson and James F. Nathan, of the central cable office. The latter was an eager participant in each race, and notwithstanding his manifest activity and enthusiasm the judges for some unexplained reason failed to bestow upon him a single prize, all of which goes to show that judges, as it has been sometimes remarked, are not always above suspicion.

This account would not be complete if it failed to chronicle the firm and dignified mien sustained during the entire time of the outing by President J. B. Van Every. He stoutly resisted all efforts to induce him to enter the ball game or join actively in any of the other sports of the occasion, and remained an impassive, albeit an interested, observer of all that occurred.

At seven o'clock about one hundred of the party sat down to dinner, which was presided over by President Van Every. After coffee had been served about fifty prizes were drawn for and distributed among the members. The entertainment committee, of which M. H. Kerner was chairman, did its work well and earned the thanks which were freely bestowed upon them.

Among those present at the dinner were: J. W. Behre, G. R. Benjamin, J. Berry, E. E. Brannin, C. J. Bresnahan, Jos. Cahill, J. A. Carberry, E. G. Carley, A. R. Carmichael, C. W. Conklin, J. W. Connelly, J. A. Dierks, D. L. Doran, L. Dresdner, H. Durland, W. G. Evans, William Finn, F. E. Fitzgibbons, C. H. Gaffney, F. M. Gallagher, D. J. Gallagher, R. F. Geissler, J. W. Gibbons, J. L. Hall, T. F. Harvey, M. J. Hayden, F. Heller, E. F. Howell, G. Irving, C. Jacobson, C. F. H. Johnson, W. A. Jones, A. F. Kelley, M. H. Kerner, C. A. Kilfoyle, Frank Kitton, A. Kline, J. T. Laidlaw, J. P. McConnelly, J. McCusker, J. F. McGuire, W. Marshall, W. C. Merley, G. H. Messner, C. H. Murphy, R. F. Murphy, R. J. Murphy, A. Nachmann, B. Nachmann, J. F. Nathan, M. J. O'Brien, R. O'Brien, M. J. O'Leary, Capt. Olmstead, R. F. Parkinson, W. E. Rath, H. Reece, B. H. Reynolds, J. P. Riley, Geo. Roehm, F. J. Scherrer, J. W. Schmults, W. D. Schram, W. A. Schuck, H. V. Shelley, J. Simmonds, T. G. Singleton, Dan. Skelton, H. A. Smith, H. Smith, W. H. Spry, J. B. Taltavall, R. Tollison, J. C. Turner, E. B. Van Every, H. F. Van Every, J. B. Van Every, J. Veitch, A. O. Wallis, Mr. West, M. T. Wilbur.

Atlanta, Ga.—J. S. Calvert.
Boston—T. F. Clark.
Canso, N. S.—C. B. Dunham.
Cincinnati, O.—C. R. Tilghman.
New Haven, Conn.—F. E. Clary.
New Orleans—T. P. Cummings.

Specifications for Hard-wood Copper Wire.

At the Atlantic City meeting of the American Society for Testing Materials, says the Electrical World, Messrs. W. H. Bassett and J. H. Clapp presented a paper calling attention to the desirability of introducing standard specifications for hard-drawn copper wire. The authors stated that no two of the specifications already in existence agree as to what should be the minimum permissible tensile strength or variation in diameter, while many of them include other requirements, such as a minimum elastic limit, a minimum number of twists made in different ways and on different lengths of wire and at different rates of rotation. The authors said that the specifications for hard-drawn copper should be standardized as have those for other more common engineering materials.

This is a good time to begin a subscription to Telegraph Age, $1.50 a year.

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Life in the Submarine Cable Service.

BY ROLAND BELFORT.

In Standard Weekly Supplement to "Empire."

So accustomed have we become to the continuity and regularity of our admirable submarine cable system—that splendid monument to British bulldog pluck, financial enterprise, and scientific ability—that we accept the most remarkable developments merely as a matter of course, and pay but languid attention to the services rendered by those alert, indefatigable sentinels of empire who carry on this truly imperial work throughout the world, frequently under difficult, and even dangerous circumstances. A gratifying feature in this connection is that the majority of these cablists are British. Men of many nationalities, notably Frenchmen, Germans, Italians, are engaged in the various branches of cabling, it is true, but only in limited numbers, and they are rarely able to emulate the British operators in either speed or accuracy. Even United States companies generally employ British operators, their telegraphers, although extremely clever, never having proved themselves equal to the task of rivaling the British in cable telegraphy. Generally speaking, the foreigner fails to realize the importance of speed and the indispensability of concentration in a profession wherein "rush" is the watchword.

Associated with the development of the world's system of cables, now aggregating about 250,000 nautical miles, is some admirable scientific, technical and administrative talent.

Over twenty thousand men and a big fleet of forty-five ships are at present engaged in the different branches of cable work—manufacturing, laying, repairing and operating. Directors, managers, superintendents, engineers, electricians and operators must all be smart men in their respective departments, for in this profession there is absolutely no room for a dolt. A resourceful mind, prompt action, personal courage, devotion to duty, and a contempt for danger are all required in the performance of their delicate duties. Wonderful zeal and energy are displayed by cable men, in peace and in war.

It would be difficult to imagine a more attractive career for an adventurous young man than that which is offered by service in any of the big cable companies. There is no exaggeration in saying that he could, by judicious changes of companies travel right round the world in the practice of his profession in the course of ten years. One man who started as an operator on a lonely Atlantic island, is now vice-president of a leading cable company, with an income of quite £10,000 a year. Several who started on the lowest rung of the ladder are now managing directors of their companies. Hundreds are now occupying lucrative positions in the various cable stations throughout the world, with salaries ranging from £500 to £2,000. Most of the promotion being effected from the inside, clever men have excellent chances of securing good positions by the display of exceptional talent and enterprise.

How are cablists trained? Some of the smartest have been recruited from the British postal telegraph department; many have graduated as messengers in the city offices of the leading cable companies; others have been trained in the schools maintained by some of the companies at their coastal stations. Recently the tendency has been toward attracting recruits of a higher social grade —boys from the public schools, sons of military and naval officers, clergymen and professional men. This will appear quite natural when it is considered that the salaries paid are generous, and that the general arrangements made for their staffs by the leading companies are quite equal to those made for military officers on foreign service. These companies always provide comfortable, even luxurious, quarters, especially at the most isolated stations, so that wherever a cablist goes he finds a hearty welcome, a fine mess, reading rooms, billiard rooms, cricket grounds, tennis courts, boating facilities, and sometimes a theater. He gets three months' leave every three years, and can make certain of a pension at the age of sixty-five in most companies. Practically, a post in an enterprise like the Eastern Telegraph Company is as desirable as a government appointment, the fixity of tenure being equal, while the financial conditions, facilities for delightful travel, chances of promotion, and variety of adventure are frequently superior. The most famous cable training school is "P.K."—the Eastern Telegraph Company's station at Porthcurno, on the Cornish coast, between Penzance and Land's End. The period of training varies from three to six months, according to the aptitude of the cadet, and the company sends telegraphers to nearly every quarter of the globe.

Every globe trotter knows the cablists; the more isolated the station the greater will be his welcome. They may be seen playing football or cricket in Cornwall or Ireland; haunting the gay boulevards of Marseilles, Brest, or Havre; luxuriating in a stately castle near Lisbon; bathing in the Red Sea or drinking of the waters of the Nile; sweltering, but active, at Aden, Zanzibar, Mozambique, Mauritius, and at various coastal points throughout India. Some are buried away in deadly spots in the middle of the Atlantic or the Pacific. Others drag out a weary existence on the West Coast of Africa or the remotest regions of Australia. There are torrid stations in the Red Sea and the Persian Gulf, where it rains only about once a year, while damp spots exist like Hong Kong, where fungi grows in one's boots during the night. Along the coasts of Africa and Brazil, Peru and Bolivia, are some horrible stations where the white man can only live with difficulty.

The "Anglo" office, on the Irish coast, has not been closed night or day, for fifty years, during which time thousands of miles of "slip" bearing the messages must have been rolled forth by the recorder instruments.

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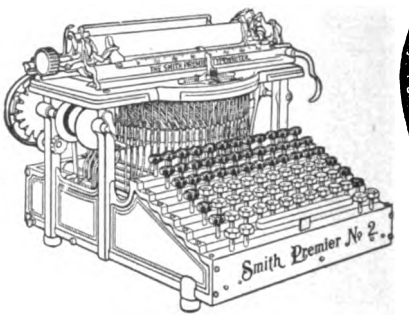

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AUGUST 1, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Confiscatory Proceedings.

Some of the states of the West must be bent upon a war of telegraph extermination within their respective boundaries, if their several and continued actions directed against the telegraph companies be accepted as evidence of such a course. The latest move, that by the state of Iowa, takes the form of a suit in which the Western Union Telegraph Company is made the defendant for the snug little sum of $898,500 for alleged violation of state laws in regard to foreign corporations. The petition consists of two counts. The first is for $100,000 for failure to pay the customary fee on capital stock, and the second, for $798,500, represents the penalty fixed by law for each day the company has been doing business in the state in violation of the state law.

We don't know the value of Western Union property within the state of Iowa, although doubtless it is less than half that of the amount demanded in the suit, but it might be well in the face of these virtually confiscatory proceedings for the company to throw up both hands and retire incontinently from such an inhospitable territory. Perhaps an intelligent court of high appeal, sustained by an aroused and better public understanding, will eventually come to the rescue of corporations that now appear to be but a target for state and municipal greed. It cannot be said that honesty of purpose is always lodged in the representation of the "dear people."

The Filing Time Rule in Georgia.

It is difficult sometimes to repress a smile, even when resentment is felt, when one observes the incongruities that unexpectedly, and not infrequently with grotesque effect appear as the result of would-be regulation of public utilities; too often, more's the pity, undertaken ostensibly in defiance of correct thinking and of proper knowledge. Abundant illustration of this fact is afforded by the laws and rules adopted in several of the states requiring the filing time to be incorporated in all telegraph messages so far as all such for intrastate delivery are concerned. So confusing is the situation that has arisen in Maryland as a result of the operation of the law in that state, which is of legislative enactment, that, as explained in our issue of July 16, the matter has been carried to the courts for its proper interpretation. The point raised, and a very pertinent one, is who shall pay for the additional words required to express the time of filing.

In Georgia a rule prevails, prescribed by the railroad commission of that state, similar in authority to the Maryland law, of which the following is the text:

> Telegraph companies are required to show on each telegram they transmit and deliver between points in Georgia the correct time, expressed in hours and minutes, that such telegram was received at office of delivery. And where the sender of any such message desires to show also the correct time of filing with initial office, the transmitting company shall, where the words necessary to express the filing time added to the words in the body of the message do not exceed ten words, carry said information free. But where such words added to the words in the body of the message exceed ten words a charge of two cents per word for each word in excess of ten shall be allowed, subject to a maximum extra charge for showing said time of filing of five cents.

This decree appears to be honored by the people of Georgia more in the breech than in the observance. This may be readily accounted for because of the fact that the burden of cost imposed by the added words incident to including the filing time is placed upon the public, for seldom, be it observed, is an ordinary message compressed within a narrower com-

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pass than the customary ten words. Obviously the responsibility for the extra charge for additional words is put where it belongs, if, indeed it is to be made at all. But at this the people object, declining to be compelled to pay for something they don't want, and very naturally so.

We do not recall that the reliability of the telegraph as a common carrier in the State of Georgia has seriously been called in question. It is only in times of great disturbance, incident to storm and flood, or strike disorder, as was the case last year, a matter, however, of rare occurrence, that the wires are ever in such shape as to delay telegraph traffic. The prevention of troubles of this nature are not usually within the province of man's control. At such times the telegraph companies promptly give notice of existing conditions. Certainly no situation has arisen, or popular outcry made, warranting interference with existing methods of telegraph administration and management. Manifestly the telegraph companies are and have been rendering satisfactory service, that which cannot be impeached. This may be also interpreted as applying with broader meaning to cover the territory of the nation itself.

Apparently the people of Georgia resent or are indifferent to officious meddling which this filing time rule saddled upon their state is looked upon as the outcome. Our advices received from all parts of the state indicate that business men, who there as elsewhere, constitute the vast majority among the users of the telegraph, profess satisfaction with the service, and who in sending their dispatches ignore and raise no question regarding the filing time proviso. They know full well that if necessity arises requiring specific identification of time in message sending or receipt, that the telegraph companies may be strictly relied upon to furnish them such information without question or delay. It was a mistaken sentiment that called into existence a filing time law. Up to the present time we are not aware of a single individual insisting upon an observance of the rule.

Aftermath of the Strike.

While the event of the telegraphers strike of nearly a year ago has passed into history, the observing mind will note with mingled feelings of regret and pain the effects of its blemishing influence so frequently discernable. This is especially true in the larger telegraph centers. Many a striking operator whether re-serving to-day at the key, or finding his livelihood as best he may, outside of the telegraphic ranks, is confused and dazed at the condition in which he finds himself. Some are not yet able to discuss fully the direction in which their true advantages lay, even under reemployment, and are wavering in an uncertainty of mind apparently unwilling yet to declare allegiance to employing interests, a condition not creditable to their manhood nor calculated to promote their future success.

Every one in order to be honest with himself, and every man is his own creditor, should possess and exercise an honest mind. An honest mind is more apt to distinguish clearly, to take a wholesome view of life; it will dictate honesty of motive and action in all relations affecting the well-being of employer and employe alike. It stands for something real, vital and compelling. If the individual has found reinstatement his duty lies wholly to the company that pays him his wages, with which in turn he buys his daily bread. To those interests, and those alone he owes unswerving loyalty. If his pay is not what it was before he assumed to take measures into his own hands to compel a readjustment in the scale of company relationship, let him remember that the fault does not lay with the company, but because he himself deliberately severed old relations, and that now in a sense he occupies the position of a prodigal. It is easy to break confidence but hard to restore it.

Our advice to those who need it, is to live down the past by correct habits, right thinking and diligent work. The telegraph still has need of bright, clearheaded and well-informed men for its present maintenance and future guidance. The pathway to success lies in scrupulous observance of and an eager endeavor to practice all things that make for company prosperity. Company prosperity means individual prosperity. Every reinstated man, putting aside the past, and with earnest resolve, should feel the responsibilities of his position. This is the time for the exercise of sturdy manhood qualities. Conditions in the telegraph service are improving rapidly. Business is being handled even more satisfactorily than before the strike and it is more free from errors, because governed by a better conscience. The truly generous, appreciative and sympathetic mind will look forward to the time when the late unfortunate troubles will really be buried in a forgiving memory, and a new era in the telegraph be established. Intelligent and high-minded faithfulness to the source that provides employment, is the one thing necessary to hasten the auspicious time.

It should not be forgotten that from the personnel of the telegraph other allied industries are continuously seeking recruits. The accomplished telegrapher stands an excellent chance of winning success in this world.

Mr. E. Boening, assistant superintendent of the Western Union Telegraph Company, Boston, Mass., who recently renewed his subscription to this paper, took occasion to remark: "You may rest assured I will say a good word for Telegraph Age at any time when the opportunity occurs, as I find it a most interesting and educational paper, and one that people in the telegraph business cannot afford to be without."

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Electricity in the United States Weather Bureau.

BY DAY ALLEN WILLEY.
(In the New York Electrical Review.)

One of the elaborate and varied applications of electricity is in connection with the Weather Bureau of the United States. So much of the delicate mechanism employed in making and recording calculations about the weather is actuated by electricity that nearly all of the complicated system is dependent on this energy, although the amount of current used is very small. When it is remembered that over two hundred observation stations are distributed throughout the country and that each is equipped with current-actuated instruments for noting air pressure, wind currents, percentage of moisture, and other data necessary in determining weather conditions, an idea can be gained of the extent to which electrical apparatus is required for this branch of the government service.

It may be needless to say that the daily weather reports published in the newspapers, and spread on bulletins from coast to coast, are obtained from a system of compilation in which the electrically operated devices play an essential part. Of course, the information for this curious "newspaper" published by the government is transmitted entirely by telegraph and telephone, so the sounder and receiver, key and transmitter are parts of the apparatus in every weather station, the wireless as well as the regular line telegraph being extensively used. In fact, the wireless stations at Washington receive as much of the weather news and transmit it to the bureau by telephone or line telegraph. As the majority of the weather bulletins are modeled upon the one issued by the Forecasting Bureau at Washington for that city and vicinity, a brief outline of the manner in which it is published will give a clear conception of the system employed elsewhere.

As fast as the weather statistics are received by the telegraph operators any information of especial interest to Washington is transmitted to one of the staff whose duty it is to edit it for composition. Two men usually are sufficient to do the composing and making up the form, for the latter is merely changed from day to day. The man who makes up the form corrects the map to be printed, placing the marks which indicate the direction of the wind, as well as other signs, upon it. As the preparation of the form begins as soon as the clerk finishes the copy, it is ready for lithographing in a very short time. Meanwhile, in the mechanical department the lithograph stone is being prepared for impression, so that when the form is ready it is reproduced without loss of time. The stone is next placed upon the bed of the press and perhaps in less than an hour after composition began the paper is being run off. The first sheets are carefully examined to note any possible errors which may have occurred. As soon as the sheets are sufficiently dry they are sent out immediately for distribution.

At the Washington bureau is located what might be called the perpetual weather map. From this the telegraph operators get the indications for every part of the United States. As fast as a bulletin is received predicting the weather at a certain place the map-maker indicates it by attaching a button of a certain color to the map. The operators at the keys only need to watch him put in the buttons to wire whether it is to be fair or rain or snow in the locality he has marked. So it might be said that this map is controlled by the electric current, since all the information received for it and given out by it comes and goes by means of key and sounder.

The weather observation station is usually indicated by the mechanism placed upon its roof. It may be in one of the sky-scraper office buildings or in a lower structure, but in either case one sees the familiar skeleton tower to which is attached the weather vane and the anemometer, two of the mechanical reporters which gather information, and sometimes the thermometer box. Another necessary addition is the automatic measure for determining the amount of rainfall or snowfall, while to-day, as a century ago, the barometer is one of the reliable methods of predicting weather, and is indispensable in making forecasts.

The design of weather-vane adopted by the government consists of an iron rod about five-eights of an inch in diameter and forty-two inches long, the tail of the vane being formed of thin wooden boards spread apart about nine inches at the outer ends. To the other end is attached an arrow point. Despite the weight of metal in the vane it revolves upon a series of three anti-friction rollers, so nicely adjusted that they do not require lubrication, and the amount of oscillation is reduced to a minimum. Connecting it to the recording apparatus is an iron rod usually terminating in a contact box, as it is termed.

The anemometer consists of four hemispheres made of aluminum or brass attached to small square steel arms. Their revolutions turn a spindle which terminates in an endless screw fitting into a series of geared wheels. One of these drives another screw, which, in turn, actuates two dial wheels divided into miles and tenths. The anemometer may be attached to the tower supporting the weather vane by a side arm or mounted above it, as may be convenient. The height of the tower varies according to the surroundings. It is necessary to have the instruments where they are exposed to the direct force of the wind—where its direction is not diverted by buildings or other obstacles.

Not only are the velocity and direction of the wind thus reported, but with the aid of the electric current they are recorded as well. The meteorograph utilized for this purpose is one of the most remarkable instruments in the weather service, for it not only keeps a record of the performances of the weather vane and anemometer, but registers the amount of precipitation or the dura-

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tion of sunshine, as the weather is clear or otherwise. For this reason it is sometimes termed a quadruple register, and with good reason. The register contains a drum around which is wrapped a sheet of paper which receives the characters made by the recording pens, which note the changes in all the mechanism. This drum makes one revolution every six hours, being moved by clockwork to insure regularity. After each revolution the drum is moved endwise about half an inch by the action of a screw, thus preventing a record already made from being marked over.

From the meteorograph wires extend to the gearing, which is actuated by the spindle of the anemometer. As the toothed wheels revolve they open and close an electrical circuit, thus operating magnets, which in turn actuate a recording pen. The direction of the wind is recorded by the use of four magnets, which, however, allow eight different directions to be noted if necessary. To the armature of each magnet is attached a long printing arm terminating in a pen point. When a current opens and closes the magnet, the printing point is forced down upon the cylinder, making a dot. The position of the dot on the paper indicates the direction of the wind. The contact box connected with the weather vane contains a series of four cam collars and levers, also four contact springs, one for each point of the compass. When the wind begins to blow directly north the base of the rod extending from the vane to the contact box presses against what is called the "north" spring, which, in turn, touches the corresponding lever, thus sending an electric impulse through the corresponding magnet. When it is blowing northeast, for example, two of the springs are brought into contact with the levers, with the result that two circuits are closed and two magnets will actuate the pens with which they are connected.

An essential part of the mechanism in the station, however, is a combined barometer and barometric recorded, which, by the aid of the current, notes and records the slightest change in atmospheric pressure, so that the observer can tell at a glance this important fact in making his computations. One form of the "barograph," as it is called, consists of a series of corrugated sheet-metal cells placed one upon the other and connected at the upper end of the series to a system of magnifying levers that operate a pen. The pen point rests upon a sheet of paper, which is held on a cylinder having clockwork within it to give it a slow rotation. The varying pressure of the atmosphere causes the cells to contract and expand, and this motion, transmitted through the levers, causes the pen to trace a line on the graduated paper, whose co-ordinates represent the pressure of the atmosphere at any given time.

Another design of the barograph which is also in use, is known as the Marvin, after its inventor, In this form of the barograph the barometer tube is placed at the left of the recording section of the apparatus, suspended by a hook from what is known as a balance. The weight of the barometer tube upon the horizontal beam with which it is connected at the top is balanced by a rolling carriage and a fixed weight. The equilibrium of this carriage is maintained by a contact spring attached to a balance beam at the extreme right and immediately over the recording cylinder. By the employment of this spring the carriage is moved into the proper position by means of a wheel turned by a horizontal screw. Every time the carriage is set in motion by the disturbance of the equilibrium caused by the movement of the mercury, the spring closes an electric circuit, thus actuating a recording pen which traces a pressure curve upon the paper cylinder. Thus, the rise and fall in the mercurial column is noted. So delicate is the adjustment of this instrument that it is affected by an atmospheric pressure as slight as the ten-thousandth of an inch.

As the thermometer is very essential in calculating temperatures, several designs are employed, and it is a fact that their records are partly preserved by being marked on paper through electrically driven markers. The thermometer is somewhat like the barograph in principle. The element that is affected by the temperature is a metal cell that has the form of a curved and flattened tube, one end of which is secured to the framework and the other end connected by a link to a lever carrying a pen point. It has also a clock-driven cylinder with its graduated sheet of paper. The tube is filled with alcohol, and as the liquid expands it straightens the tube and causes an electric impulse to move the pen over the paper, making an irregular line that represents the change of temperature.

The sunshine recorder is constructed on the principle of the differential thermometer. Inside of a vacuum tube is a tube having a bulb formed on each end, and the inner tube extends into a lower bulb nearly to its bottom. Both bulbs contain air, and the lower one, which is coated with lampblack, has a quantity of mercury in its lower part. The mercury also extends up into the tube. Two wires enter the opposite sides of the inner tube between the bulbs, and these wires form part of the electrical circuit of one of the magnets of the triple register, which magnet occupies a side of the triple register by itself. The armature of the magnet, through a pawl-and-ratchet mechanism, gives the pen lever of this magnet a step-by-step motion, first to one side and then to the other. This action takes place when the sun shining on the heat-absorbing lampblack causes the air and mercury in the lower bulb to expand and force the mercury up the inner tube until it completes the electrical circuit between the curves in the inner tube. Thus the clock breaks the circuit for an instant every minute. When it is cloudy the pen simply traces a straight line.

The recording rain gauge consists of a cylindrical casing supporting an open funnel above and a reservoir below. Beneath the mouth of the

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funnel is a pivoted tray or "bucket" divided into two compartments under the funnel mouth. When this is filled with rain water the water is emptied into the reservoir and the empty compartment brought under the mouth of the funnel. This tipping of the bucket momentarily closes an electrical circuit, including the sunshine-recording magnet of the triple register, and causes the pen to follow a motion in general like the sunshine record, but so irregular is it, having either more or less stops in a given time, according to the rapidity of the rainfall, that it is easily distinguished from the sunshine record.

Another interesting form of mechanism in connection with the work of the forecasting bureau is the recorder attached to the weather kite. To the kite is fastened a small anemometer, which is connected by wiring to the little electrical recorder which is enclosed in an aluminum case. It is modeled on the same principle as the quadruple register already described, but is only intended to note the direction and velocity of the wind, so that it is provided with but two pens for this purpose. With the kite instruments many valuable data have been obtained at heights several thousand feet from the surface.

Improving Way Room Facilities.

BY W. J. ROSS, NIGHT CHIEF OPERATOR, MEMPHIS, TENN.

I never visit even our most modern and up-to-date large telegraph offices that I am not surprised at the meagre facilities and old-time equipment of the way room. And it is with a view of possible benefit to the service that I venture the following suggestions.

I am a believer in spring-jacks and combinations in the way room. I do not mean by this that I am in favor of combinations as I have seen them—of twelve to sixteen wires on one table where business is slaughtered in a foolish effort at economy by trying to make one man handle the entire traffic of the twelve or sixteen circuits. Such action always results in serious and frequent delays and is, I believe, responsible for the bad repute into which this method of "facilitating" traffic has fallen.

We will take for an illustration one side of a series of way room tables carrying eight circuits —four on each side. I would first double-deck the tables and place enough hooks on each circuit so that no two messages for different points need be hung on the same hook. Next, above each circuit, on the upper deck, I would place spring-jacks to which are connected not only the wires on that side of the table, but also the "run-in" railroad wires for the respective offices in that circuit. Thus an operator instead of being compelled to pick up his typewriter, and walk eight or ten feet, could bring to his table any wire in the series either to receive or send from. In addition to this, when necessary to run an office in on the way wire from the corresponding railroad wire, as is the case with at least a third of our messages, the operator, instead of referring the message to his traffic chief and thence often to the wire chief for a "run-in," can, himself by a simple change of wedges, cut in on the railroad wire, get his man, run him to way wire, and send the message before the traffic chief could have gotten to the Irish quad, or other antiquated piece of machinery that may serve a like purpose.

The lists of offices in way rooms as a rule are also very abortive affairs. I believe that all the information necessary for the operation of that particular circuit should be shown on the call sheet. This should include points for which offices relay, places that "loop" on, the office calls, time of closing, and railroad wires that are in the different way offices.

I believe an adoption of a system similar to this, arranged to meet the needs of an office, would increase the efficiency of the operating force at least twenty per cent, and very frequently permit a reduction of the force, especially at night and Sunday when the work is light and scattered; and it would certainly relieve the traffic chief of a great deal of work and responsibility in the matter of running delinquents in from railroad wires.

I must confess that the suggestions offered are largely theoretical, as I have not seen them fully tested, but as it is chiefly through theorizing that we achieve advancement, I would like to see the suggestion put into practice and know the result.

Why not open a department in Telegraph Age "For the benefit of the service," where the "feeble-minded" brethren can air their views upon this and kindred topics?

Rev. F. L. Odenbach, S. J., director of the Meteorological Observatory of St. Ignatius College, Cleveland, has invented a method of telephoning to moving trains. The invention also provides a telephone system between moving-train units, and between moving and stationary points and between stationary points upon railways. It is intended to accomplish such signaling and telephoning only within certain predetermined limits. Further objects are to provide means upon moving railway units, enabling the operator of each unit to determine whether the other is behind or before him, and at what speed such other unit is moving; to apprise the operator of a moving car or train of an open switch or signal of danger ahead of him; and to adapt these means to a block system, or local system, wherever such system is desired. The Western Electrician describes the system in detail.

Mr. N. E. Smith, of New Haven, Conn., superintendent of telegraph of the New York, New Haven and Hartford Railroad Company, in a recent letter, took occasion to say: "I derive much pleasure in reading Telegraph Age, and should feel that something is missing should it fail to arrive promptly."

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The Mysterious "Wire."

When the messenger delivered the mysterious telegram at the office of the superintendent of the coal-service of the Union Pacific Railroad there was consternation. Mr. Clark had been spending sleepless nights endeavoring to keep everybody good natured along the three thousand miles of railroad.

Coal was very scarce; engine coal was being confiscated daily by desperate citizens of the small towns, but the worst thing to fear was the coming elections and possible radical legislation. Then came this message:

336 N. P. U. B. N.
Cheyenne, Wyo., Sept. 16, 1906.

D. O. Clark, Omaha, Neb.

If something is not done at once to relieve the fuel situation here I will take measures to find out why. You evidently forget that there is a legislature to be elected in a few weeks. Legislation may bring you to your senses.

R. M. Smith, 3.45 P. M.

Mr. R. M. Smith was not known to Mr. Clark. The records of the office were scrutinized, but they revealed nothing. Then the telegram was taken to the telegraph office with a request that the Cheyenne office enlighten Mr. Clark as to the identity of the sender of the message.

Messengers were sent about town by the manager of the Cheyenne office to make inquiries, but R. M. Smith could not be located. The Omaha office demanded that the files of the Cheyenne office be searched for the original telegram filed there. That was done, but the original of the message was not discovered.

Mystery!

Next, the superintendent of telegraph took a hand in the affair, proceeding to "jack up" the manager of the Cheyenne office for carelessness and poor management in allowing a telegram to become lost from the files. Trying to make good, the manager kept messengers scouring the town in search of "R. M. Smith."

No such man was located, and no light could be shed on the origin of the strange message.

Mr. Clark grew impatient and then angry. He had the telegram; it came from somewhere; so he put it up to the telegraph department to say what about it.

The Cheyenne office was turned upside down. There was no getting away from the affair without some explanation. It was a case of find Smith or find the original message.

Finally, sales agent A. H. Doane, of the general offices, was sent all the way to Cheyenne—a distance of five hundred and sixteen miles—to investigate. After spending a whole day in probing, Mr. Doane returned to Omaha with the information that he had scoured the city of Cheyenne from end to end without finding a trace of "R. M. Smith," and that he had gone through the Cheyenne office with a fine-tooth comb without discovering the slightest trace of the message.

Just then it dawned upon the mind of some one at Omaha to find out what operators sent and received the telegram. The service at the top indicated that the message was number 336; that it was sent by operator "P. U"; that it was received by operator "B. N."

Who was "P. U."? Who was "B. N."? It was simple enough to find out, and operator "P. U." at Cheyenne was questioned, but he could not recall whether he had ever sent such a message or not.

Operator "B. N." was Ben. Sprague, who became deathly pale when he was confronted with the telegram. Shamefacedly, he acknowledged that the message had never been transmitted over the wire; that nobody connected with the Cheyenne office had ever seen it; that "R. M. Smith" was a myth.

When he could get the lumps out of his throat, he followed the manager of the telegraph office up-stairs to the office of Superintendent Clark to offer whatever explanation he had to make.

And this was the solution of the great mystery:

Sprague had bought a new typewriter. He had his own ideas as to what style of type was best suited for the work of the office; so, when ordering the machine, he had requested that it be fitted with a small, neat letter, different from anything in use there.

Proudly, he showed his new machine about the office. It was admired by every one. By way of trying the type, he wrote several messages on telegraph-blanks, all of which were out of whole cloth—imaginative messages of his own making.

As these alleged messages were written, one after another, they were taken from the machine and torn up. It happened, however, that the time for Sprague to be relieved came in the midst of his practise.

Taking the typewriter from the table where he had been working, he set it in a window, picked up his hat and went home. Later his "relief" noticed that there seemed to be a message still in the carriage of the machine and removed it. The telegram looked all right.

The operator who found it—more than an hour after its apparent receipt—thinking that he was doing Sprague a great favor, hustled it up-stairs to the office of the coal department, and the mystery was born.

Sprague, in his haste to leave the office, had failed to remove the last of the "fakes" which he had written. This was the one which caused the mischief. It was one of the queerest telegraphic "bulls" that ever occurred in the history of the service.

Sprague expected nothing less than dismissal, but he got off with a severe reprimand, after which the fake message was carried about the telegraph-office, shown to each of the twenty operators, with an explanation of how it happened, what it did, and a general warning never to let such a thing happen again.

All of which goes to show how easily a telegraph operator can "do things." Ross B. Franklin, in the Railroad Man's Magazine.

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International Congress on Electrical Units and Standards.

The general object of the International Congress on Electrical Units and Standards, which is to meet on the invitation of His Majesty's government in London in October, is to consider and advise as to the steps which should be taken to bring about agreement in the definition of electrical units which form the basis of legislation in different countries, and in the methods of constructing and employing the electrical standards necessary to give effect to these definitions.

It is hoped that the delegates to the Congress may find themselves able to embody their conclusions in draft articles which might be commended to the several governments represented as a basis for uniform legislation and administration in relation to electrical units and standards.

The fundamental units of electrical measurement are the ohm, the ampere and the volt. Of these two are primary units, being independent, and the other secondary or derived. It is generally agreed that the ohm should be accepted as one of the primary units. There is some difference of opinion as to whether the ampere or volt should be the second. This point will be one for the conference to consider.

Again, the ohm is realized by means of the resistance of a column of mercury of definite dimensions, the ampere by means of the electrolytic deposition of silver, and the volt by aid of a standard cell.

If this method of realizing the units be accepted by the congress, specifications for the ohm and ampere will call for consideration, while the standard cell must be selected and the method of setting it up prescribed.

In view of the scientific questions raised in connection with each of these matters, including also the choice of the two primary units, it will be suggested at an early meeting of the congress, should such a course appear to be desirable, that the congress should appoint a small technical commission of experts to discuss the questions and report thereon to the congress. The congress will also be asked to consider the best methods of securing uniformity of administration in the future, and for arriving at a decision on any questions left undecided at the close of the congress.

It is desirable to have some definite questions before the congress, and with this object the following propositions embodying conclusions arrived at by the representatives of the various National Standardizing Laboratories which met at the Reichsanstalt in 1906, and which are also generally in accordance with the decisions of the Chicago congress held in 1893, will be brought forward as a basis for discussion:

First, that the ohm shall be the first primary unit; second, that the ampere shall be the second primary unit; third, that in consequence the volt shall be treated as a secondary or derived unit; fourth, that the international ohm be defined as the resistance at the temperature of melting ice of a column of mercury of uniform cross-section terminated by planes at right angles to its length 106.3 cm. in length and 14.4521 grammes in mass; fifth, that the international ampere be defined as the unvarying electrical current which, when passed through a solution of nitrate of silver in water, deposits silver at the rate of 0.001118 gramme per second; sixth, that the international volt be defined as that E.M.F. which, when applied steadily between the ends of a conductor of resistance 1 international ohm produces a current of 1 international ampere; seventh, that the Weston cadmium cell be adopted as a convenient standard of E.M.F., having at a temperature of 17° C. an E.M.F. of .... international volts, but that it is undesirable that the number representing the E.M.F. of this cell should be the subject of legislation in any country; eighth, that specifications dealing with the methods of setting up mercury standards of resistance, of realizing the ampere by the deposition of silver, and of preparing standard cells be issued with the authority of the congress, and that for this purpose a technical commission be appointed to prepare these specifications, and ninth, that the congress consider and advise as to the best method of securing uniformity with regard to the fundamental electrical standards for the future.

Interference of Transmission Lines.

Perhaps one of the most important cases of interference between two electric companies, is being heard in Chicago, in connection with the application of the American Telephone and Telegraph Company for a permanent injunction restraining the Illinois Traction Company from making alive the high-pressure 33,000-volt power transmission wires, which have been erected immediately above the main lines and parallel with the wires of the American Telephone and Telegraph Company through the town of Lincoln, Ill., and in the main street of the town, Chicago street. The case is exciting great interest owing to the fact that the decision will affect such construction at numerous other points throughout the state of Illinois. The result of the case means a great deal to both parties; a better idea can be obtained of the interest taken in this case from the fact that the telephone company's side introduced testimony in its behalf from twenty to thirty of the prominent engineers on this continent.

Mr. P. W. Drew, superintendent of telegraph of the Wisconsin Central Railway, and many years the secretary and treasurer of the Association of Railway Telegraph Supterintendents, in renewing his subscription the other day for another year, took occasion to write: "I congratulate you on the successful way you have made Telegraph Age a necessity. We can't do without it in our business. I enjoy every number."

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Work of the Signal Service in Alaska.

General James Allen, the chief signal officer of the United States army, has under him 1,250 men. Of these 210 officers and men are in Alaska. They have now completed nearly 10,000 miles of cable, wire and wireless system, serving fifty places where in a year 260,000 messages have been received, many sent from the far Eastern States.

So difficult is this work in the wilderness that no individual or company has tried to establish a telegraph system, and therefore the government does all the communicating between the Territory and the rest of the country, whether by mail or by wire. But such work is easy contrasted with running a line across the tundra.

This treeless, bottomless, vegetable sponge is capable of sustaining heavy weight only when winter has turned to ice the water contained in it. Even in winter the telegraph poles sometimes break through the frozen crust and half a day may be needed to dig one out of the ooze, if indeed it is not down so deep that efforts to recover it are useless. To set a pole in the tundra is difficult because it must be forced down many feet to reach a firm foundation. Yet for hundreds of miles the telegraph men of the Signal Corps have often found it necessary to hew a lane through miles of forest in order to make a highway of the tundra in their operations.

While the sheets of ice into which Nature turns the Alaskan rivers in winter permitted the service to use these streams for pack trains in hauling equipment for stations and lines, the workmen were continually menaced by the storms which sweep down the valleys. The Alaskan storm is a blizzard in violence. Usually the snow falls in a sandlike powder that is driven in masses, and in an hour may drift to the height of a man. With the mercury a score of degrees below zero human life cannot exist exposed to one of these blizzards. There have been times when a line squad have been kept prisoners for a week or more in the clump of trees where they have sought refuge to save themselves from such a storm.

The sight of a glacier spanned by telegraph poles can be seen out in the Tanana country. In a number of places it has been necessary for the Signal Service men to turn into mountaineers to accomplish their purpose, for the lowest pass in a range may be a thousand feet above the line of perpetual snow. This means hard work and plenty of it. No poles can be cut on the ground, because no forests are at this altitude; so the poles must be hauled from the valley below up the slopes with ropes carried on the shoulders. The site for the pole may be an ice covered rock in which a hole must be blasted. As the movement of the glaciers is very slight, the lines can be built as durably as on the solid earth.

One of the largest sections of the military telegraph in Alaska is along the Mississippi of the Territory—the Yukon. As this stream rises rapidly when in flood, one of the most difficult tasks of the service is to keep the line in repair. As it is, long stretches are frequently carried away by freshets. Such an accident happened in the spring of 1907. A rapid rise in the Yukon broke the thick ice into cakes and sent them swirling seaward, carrying away trees and shrubbery and crumbling away the river bank. Over one hundred miles of telegraph was destroyed by the ice projectiles, which broke off the poles like so many splinters of wood or tore them out of the earth.

The communication by wireless telegraphy in the Territory has been very successful. The messages are sent with apparatus, much of which has been designed by experts in the service. Messages sent over one hundred and nine miles have been received clearly and distinctly. For this reason it is intended to enlarge the wireless system and avoid the arduous work in setting poles and stretching wire.

Plans have been made for wireless installations with a view to furnishing a complete chain of wireless stations from Safety Harbor to the main land of the United States. In entering upon this plan the army has co-operated with the projected plans of the navy. Money has been appropriated for the construction of a station at Fort Gibbon to connect the existing wireless stations at Safety and St. Michael with the proposed naval station at Valdez and thence via the proposed station at Sitka to Tatoosh Island, off the entrance of Puget Sound, and to San Francisco. This will ultimately give a complete chain of wireless stations supplementing the present land line and cable system from Norton Sound to the United States.

To supplement this system and to reach other points in eastern Alaska the Signal Corps has now in process of installation two wireless stations, one at Fairbanks and one at Circle City. These stations are about one hundred and forty miles apart and are designed to have a radius of action of about two hundred and fifty miles. The instrumental equipment has been purchased and built, the electric power being derived from a gasoline engine. The antennae, or wires, are to be suspended by the use of steel towers one hundred and seventy-five feet in height. The establishment of these permanent stations should enable communication to be maintained if desired with boats on the Yukon River as well as with smaller outlying stations and camps by using portable field sets.

Mr. George M. Dugan, of Tip Top, Ky., formerly superintendent of telegraph of the Illinois Central Railroad Company, recently in renewing his subscription for the twentieth consecutive year, took occasion to write: "I take pleasure in enclosing my check for the usual amount for the continuance of my subscription to your valuable paper. It is one which every man, woman and child connected with the telegraph and telephone service should read. For the moderate price at which it is furnished the paper should be within the reach of all."

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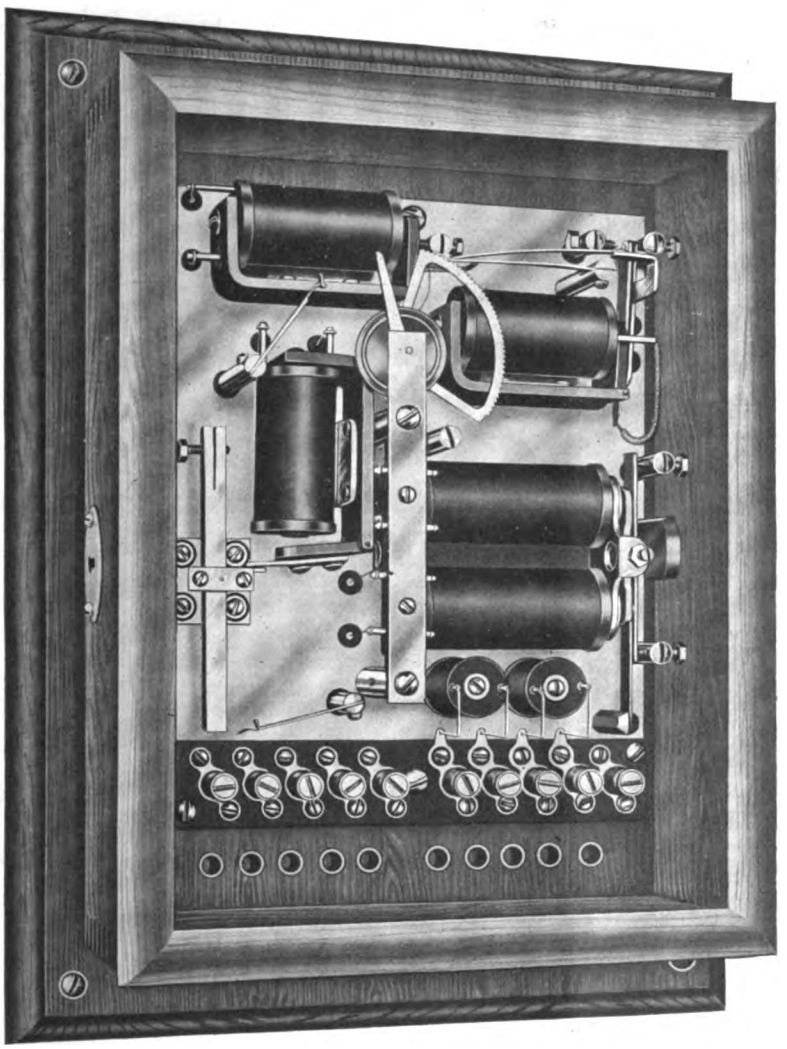

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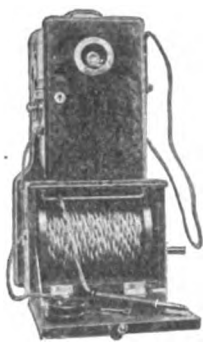

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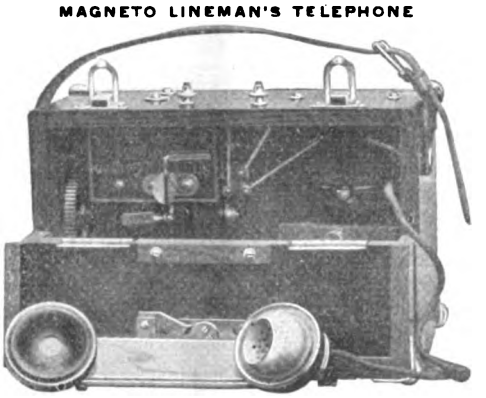

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KELLOGG RAILWAY TELEPHONES AND DISPATCHING SYSTEMS

ARE COMPACT, DURABLE AND WEATHER PROOF

RELIABILITY IS THE KEYNOTE OF THEIR SUCCESS

VETERAN TRAINMEN APPRECIATE THEIR PRACTICABILITY

CORRESPONDENCE SOLICITED

SEND FOR BULLETINS AND DESCRIPTIONS OF SYSTEMS IN ACTUAL SERVICE

ADDRESS DEPT. R

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The Railroad.

The Pennsylvania and the Lehigh Valley Railroad companies have filed a bill in equity in the United States Circuit Court, seeking an injunction to restrain the Interstate Commerce Commission from taking any further proceedings in pursuance of its order of March 3 last to enforce the nine-hour law for railroad employes.

A patent, No. 892,203, for a signaling system for railroads, has been awarded to Max W. Zabel, Chicago. Railroad signaling system having means whereby any block in a despatcher's division may receive a selective signal to the exclusion of all other blocks, and whereby a positive indication is given to the despatcher that the selective signal is received.

The few words spoken by Mrs. W. F. Williams in behalf of the lady guests present at Montreal at the time of the convention of the railroad telegraph superintendents, in presenting the silver card receiver to Mrs. W. J. Camp, chairman of the ladies' committee, in recognition of her many and gracious attentions to the visitors during their stay in the Canadian city, has since been frequently referred to as a most felicitious expression, marked by fine address and generous appreciation.

Mr. P. W. Drew, of Chicago, secretary of the Association of Railway Telegraph Superintendents, and superintendent of the Wisconsin Central Railway, in a recent letter makes the statement that train despatching by telephone is a very live issue in the West. Mr. Drew's report receives confirmation in all parts of the country, for train despatching by telephone is evidently a live issue everywhere. We believe, however, that many of the superintendents of railway telegraph are making a great mistake when they attempt to utilize old telegraph circuits for telephonic purposes. The telephone equipment should properly be of up-to-date apparatus; the selectors used should be of the best. Makeshifts in these particulars will not permanently meet the requirements of busy railroads and their adoption will only lead to trouble. If the equipment is first class in every particular the results reached cannot be other than satisfactory. If the equipment is of the makeshift type the service rendered will be of the same character.

The Delaware, Lackawanna and Western Railroad Company, L. B. Foley, superintendent of telegraph, began the operation of its trains by telephone on the main line between Scranton, Pa., and Binghamton, N. Y., on Sunday, July 26, using the Gill selector system. The operation of trains on the division extending from Scranton to Washington, N. J., will also soon be conducted by telephone, the Burlington system being used. As soon as the necessary telephone wires are constructed on the division extending from Binghamton to Buffalo, a distance of 203 miles, trains will be despatched by telephone instead of by telegraph as now. The branches extending from Binghamton to Syracuse and Oswego will also be operated by telephone as soon as the necessary equipment can be installed, which will be by October 1. The division from Washington to Hoboken, N. J., will not receive a telephone equipment until present unusual road complications can be met and overcome. The company will adopt as their standard the selector that after trial shall be deemed best to meet requirements.

The joint committee of the American Railway Association on interlocking and block signals, which is made up of the committees on train rules and safety appliances respectively, with F. C. Rice, of the Burlington, as chairman, were taken by Mr. Rice on July 17, following a meeting in Chicago on the 16th inst., to inspect the Burlington's system of train despatching by telephone, and the safety stop device installed on that line for trial at the request of the Interstate Commerce Commission. The party was taken to Aurora, thirty miles from Chicago, by special train, where special facilities had been provided for the train despatching demonstrations. (A report on this system read by W. W. Ryder, superintendent of telegraph of the Burlington, before the Association of Railway Telegraph Superintendents at Montreal, Que., June 24, has already appeared in Telegraph Age). The installation of this system on the Burlington is due primarily to the initiative of Daniel Willard, second vice-president, and Mr. Ryder has attended to the details. In the demonstration for the American Railway Association committee, each person was provided with a receiver enabling all to "listen in" simultaneously as the orders were handled. The statements made in Mr. Ryder's paper regarding speed of handling, distinctness, etc., were well borne out, the opinions of the visiting officers being unanimous upon this point.—Railroad Age Gazette.

Among a number of books on the market treating of the general subject of train despatching, that bearing the generic title of "The Train Dispatcher," written by A. W. Early, a train despatcher himself, has gained a wide popularity, its value being based on the fact that it is one of the best books of the kind ever produced. It supplies a certain practical information of a class desired by the ambitious worker as a guide and inspiration to him in his daily work. Its 104 well printed pages are packed full of educatory matter, and the volume should be, as it has been, a welcome possession to every telegraph operator and train despatcher in the railway service. This book will be sent to any address on receipt of price, $1.00. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progressive operator; $1.50 a year.

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Dry Battery.*

BY U. J. FRY, OF MILWAUKEE:

Superintendent of Telegraph of the Chicago, Milwaukee and St. Paul Railway Company.

We beg to report to you the final results of our experiment with dry battery block wire service between Brookfield and Waukesha, Wis., referred to in our note of last year, to the effect that the thirty-two cells used, failed after three years' service, and means an expense of $5.12 as against $102, first cost and maintenance for three years of 32 cells gravity battery.

As applied to the service on a railway operating 2,000 miles of block signal service and using our present form of block wire, we estimate the 4,000 cells of gravity battery necessary, first cost and maintenance, for three years at $14,000, while double the number of dry cells (8,000) will cost $1,280, or a difference of $12,720; $4,360 per year, or $2.18 per mile of road per year.

While constructing a telegraph line along our Coast Extension Railway we found it impossible to prearrange for gravity battery service and are using dry battery temporarily by connecting up a sufficient amount to operate a wire one hundred, or one hundred and fifty miles in length, inserting a sufficient amount of resistance to bring the current down to about fifty milliamperes while the circuit is short. When more wire is added we cut out resistance from time to time to equal the wire resistance added, maintaining as near as we can fifty milliamperes current.

It can readily be appreciated that by using a large number of cells, and inserting resistance, the discharge from each cell will be exceedingly low, the expense small and the convenience afforded us in that we can carry the battery with the construction outfit until needed, when we can set it up in almost any place and pay no further attention to it except to cut out resistance occasionally. We used a set of dry battery in this way for six months, when it failed, at which time we had arranged for gravity battery service.

While it is not possible at all times to find a safe place for gravity battery to operate local sounders we found it very convenient to use fifty ohm sounders and keys only until we can construct station houses and arrange for standard instruments.

In these concluding lines on dry battery we find we have been unable to furnish as much information as we should like to have done, and in lieu of what we did not say, and assuming you will permit, we thought perhaps a few of our shop notes might serve to interest some of the younger men in the service, and I submit the following:

To determine the number cells of gravity battery necessary to furnish approximately thirty milliamperes current for one, two, three, four or five wires, when the resistance of each is about equal, select one of average resistance, add the relay resistance, multiply by constant given herewith, and opposite the number of wires under consideration. The amount shown will represent the total number of cells required, which should be divided and half the number placed at each end of the circuits.

Number of Wires.	Current Milliamperes.	Constant.
1	30	.032
2	32	.034
3	34	.0365
4	36	.039
5	38	.0415
1	45	.049
1	50	.055
1	55	.061
1	60	.066
1	65	.071

While it is not theoretically correct this formula will be found sufficiently so for ordinary cases.

It is understood that when using gravity battery the current will be reduced about two milliamperes for each wire added on account of the internal resistance in the battery, while with dynamo current the drop, if any, will not be noticeable.

In each of the cases shown, when all wires are closed, each will receive approximately thirty milliamperes. If one should be opened the current in each remaining closed will rise about two milliamperes, etc. Should three be opened, the current in those closed would rise six milliamperes.

Not more than four wires should be fed from the same source, because the variation during damp weather, when it is necessary to adjust high, becomes so great and margin small the wires will not work well. Five wires would cause a variation of ten milliamperes, and you can appreciate what this means under such conditions.

When inspecting our main line battery, or for testing one or more cells of dry or gravity battery, we find it convenient to have a small compass with us. One that costs twenty-five cents will answer the purpose, and by making a few tests with battery we know to be bad with one we know is in good condition we can form some idea as to what reading we should have and decide accordingly.

Place your compass conveniently near the one or more cells, bring a wire from one pole of the battery to the compass, place it on the compass immediately over and parallel with the needle, hold it firmly with one finger, and when the needle is quiet complete the circuit with a wire from the other pole and note the deflection of the needle.

While you, no doubt, are familiar with these matters, we thought perhaps some of your men may have forgotten, and it is for such we respectfully submit these items.

*A paper read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

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Qualifying Operators for Train Despatching.*.

BY C. S. RHOADS, OF INDIANAPOLIS.

Superintendent of Telegraph of the "Big Four Route."

When we consider that about ninety per cent. of young men make failures of their chosen vocation it is easy to see that only the fact of the individual being the sole sufferer thereby is all that prevents this startling condition from causing serious disorder in our complex business fabric. Few relatively, of course, of this ninety per cent. are train despatchers. Just consider for a moment, however, what failure in this profession means; any one of numberless oversights or careless risks and mistakes may distribute suffering to dozens and even hundreds of people who may never know even the name of the man whose failure at this chosen profession has involved them.

If qualifying an operator for the important position of train despatcher consisted merely in acquainting him with the standard code, our task would be a comparatively easy one, but the work of the train despatcher exceeds that. To be successful in the true sense of the word, the aspirant must be an extremely resourceful individual, with many and varied attributes that go to make safe service. Some one has said that "Wisdom is knowing what to do next, and skill is knowing how to do it." So our first duty in looking for material is to find the fellow who at least has the first of these attributes; that is, one who is not satisfied with what he is doing as an operator merely, but is ambitious for promotion —in this instance to become a train despatcher, and who is wise enough to take advantage of every circumstance offering that tends to fit him for his calling. Our next duty should direct us to aid him in becoming skilful in his occupation. He should be able to send good Morse and likewise to receive the same, good and bad and indifferent, as it comes; and as a further up-to-date qualification he should cultivate a telephone voice, for the despatcher of the future will no doubt 'phone his orders; hence, clear pronunciation, minus stammering, will be a necessary requisite. He should first acquire proper experience at a way station, becoming familiar with all the little details of station work. This includes not only that devolving upon the agent and operator, but also that of the trainmen. When he has earned promotion to the despatcher's office he will enter upon his higher duties possessed with a knowledge gained by diligence and observation which gives him an advantage over the man who has not had the benefit of the station training. It is obvious that the more training he has in this direction the sooner he will be qualified for further advancement to the position of despatcher itself. The time of probation in that department, in addition to his natural ability for the work, depends largely on the opportunity he has to observe and familiarize himself with the despatcher's work. Preferably he should act as copier for a despatcher; in that capacity he not only has the better chance to become qualified, but the despatcher has an opportunity to try him out, and if the despatcher himself, is properly qualified as a teacher, he will soon be able to pass judgment as to the applicant's adaptability and fitness for promotion. With the advent of shorter working hours the operator, if he is wise, and aspires to a larger usefulness, can find time to devote some spare hours each day in keeping up the train sheet for the despatcher, and in going out on the road, and so becoming familiar with the trials and tribulations of the trainmen and in learning the location of every switch and siding. In no part of the service is a complete knowledge of detail more important than in this.

When we come to enumerate the items that constitute all the elements that stand for success in train despatching, possible candidates are apt to be frightened by the apparent multiplicity of duties required to meet the demands of the position. But it is just this underlying fact that every applicant should understand in the beginning, and it is our duty to see that they have the idea thoroughly instilled into them that "a little knowledge is a dangerous thing" in connection with despatcher's work. In examining operators for promotion a full and complete knowledge of every factor of safety, including what might be termed only "precautionary" items, should be required of the candidate. While some may argue that a person is not at his best until after he has made a few mistakes, we must urge that the work of the despatcher does not permit of this exception. Certainly no operator should be approved for promotion whose record does not imply that "in all cases of doubt or uncertainty he will take the safe course and run no risks."

* A paper read at the convention of the Association of Railway Telegraph Superintendents at Montreal, Que., June 24-26, 1908.

The age limit having been reached by the telegraph superintendent at Dublin recently, his consequent retirement from the service was referred to by a local telegraph journal in the following paragraph, characteristically Irish, at least in expressive mention, but which cannot be said to bear striking evidence of regard for the man and poignant grief at his going; it will stand unique as a farewell send-off:

> It can scarcely be said that any real progress has been made during his tenure of office. He was undoubtedly a man who was inclined to shirk responsibility on any important question, and could be described only as an adept in the game of shuffle, devoid of virtues or vices, in official matters.

Every telegrapher who loves his profession, who is determined to master its technicalities, and thus insure for himself the confidence and respect of his official superiors and place himself in the direct line of promotion, should subscribe for and become a careful reader of Telegraph Age.

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The Military Telegrapher in the Civil War.

PART SIX.

William A. Sheldon, a military telegrapher during the Civil War, and for many years past a resident of New York, had an active army career both in the East and West, or, more properly speaking, Southwest. During the major part of the war he was attached to the Department of the Gulf as chief operator, and held the position of manager at New Orleans. He had previously been a cavalry officer in the Army of the Potomac, from which he derived an experience that afterwards in his operations in connection with the telegraph in the Southwest, proved to be of much value to him. In a letter to Colonel William R. Plum, the historian of the military telegraphers, dated back in the seventies, Mr. Sheldon writes most entertainingly of some of his exploits in that particular field. In part he says:

"The value of the telegraph as an auxiliary aid to the army, during the Civil War, is well known in the North, where daily communication was had, with all the different department commanders throughout the North and West. The Department of the Gulf, however, under the command of Generals Benjamin F. Butler and N. P. Banks, being completely isolated from any of the others, and difficult of reach, the quickest communication therewith being by steamer, very little has been made public of the telegraph in connection with that field of operation.

"Shortly after the departure of General Banks to take command of that department I was sent out by General Anson Stager to report to Captain Bulkley, A. Q. M., at New Orleans, for duty. We reached Quarantine, the station below the city, on May 1, 1863. Here our steamer was stopped under the stringent laws govering quarantine. We had a load of government stores on board, besides having a schooner in tow loaded with siege guns and ammunition. The officer in charge was anxious to reach New Orleans as quickly as possible and a message was sent across the river to the telegraph station, giving notice of our arrival and asking New Orleans headquarters for orders to come up to the city. After waiting nearly all day and receiving no reply, I applied to the captain and doctor requesting to be sent over to the office to see if matters could not be hastened. This I was allowed to do, and here for the first time I became acquainted with the demoralizing effects caused by the assumption of authority by officers of the army, some favorite of the commanding general being placed in charge of the telegraph. In this instance General T. W. Sherman, at that time military commander at New Orleans, had in the absence of General Banks, who had started on his first Red River campaign, taking Captain Bulkley with him, temporarily, had thought best to place one of his officers in charge of the telegraph department. The two operators in New Orleans rebelled at this, and being threatened with imprisonment, tendered their resignations, notifying Captain Bulkley of what had been done. It was because of this state of affairs, no operators being on duty, that caused our delay at Quarantine. Through a message which I personally sent to the operator stationed at Algiers, on the opposite side of the river from New Orleans, explaining the circumstances of our detention and whose good offices I obtained in the matter, an order was shortly secured permitting us to pass up the river. New Orleans was reached early the next morning and an interview was had with Captain Bulkley, who had been hurriedly summoned to return in order to adjust matters involved in the resignation of the discontented operators. I presented my letter from General Stager, was cordially received, and placed at once in charge of the office as well as made chief operator of the department.

Shortly after my reaching New Orleans the command of our army forces passed from General Sherman to General W. H. Emory, who seemed to have a clearer conception of the duties and responsibilities attaching to the telegraph, and as a result my position became a very pleasant one.

The telegraph lines under my charge consisted of a single wire extending down the river to South West Pass. It had only three offices in the one hundred and ten miles of its length, namely, Quarantine, Fort Jackson and South West Pass, with a test station at the head of the passes. That part below Quarantine extended wholly along the edge of the river and was accessible to the repairer by boat only. Then there was the line across Berwick Bay, via the New Orleans, Opelousas and Great Western Railroad A line was kept working as far as New Iberia, until General Banks cut loose and struck across to Alexandria when the part west of Berwick Bay was abandoned. On the railroad line we had only three offices, one at Algiers on the opposite side of the Mississippi from New Orleans, another at Bayou Lafourche and one at Brashier City on Berwick Bay. On the Northern Railroad we had but one post, Pass Manchac. A line also extended to the Rigolets, or entrance to Lake Ponchartrain, but was not used during my stay in New Orleans because we lacked operators.

The up-river line to Baton Rouge, one hundred and thirty miles in length (from which point the line was put in order to Port Hudson during its siege and communication established, between the different division commanders) had offices at Port Hudson, Baton Rouge, Donaldsonville and Bonne Carre.

To ensure protection to the line a patrol of cavalry was constantly on guard. Late in the afternoon one day during the siege at Port Hudson the line suddenly went down. Bonne Carre was the only office that could be raised. Early the next morning Bonne Carre called and sent a message from the officer in command of the patrol saying that two hundred guerillas were reported just below Donaldsonville and had torn down the telegraph wire, and permission was asked to with-

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draw his force inside the works at Bonne Carre. To this General Emory replied that if he was fully satisfied the report was correct the withdrawal might be made. Several hours later the report came that the command was safe within the works at Bonne Carre. For nearly two years I had been in the cavalry service, mostly in the Army of the Potomac. Now, a man learns a good deal in that particular branch of army work, and from certain features of the report that reached us respecting the guerilla story, I had my suspicions aroused that the facts of the case were not exactly in accordance with those we were asked to believe. I so expressed myself to General Emory. It was necessary to restore communication with General Banks at Port Hudson. I sought and obtained an order from General Emory to proceed to Bonne Carre by steamer, to use the cavalry stationed at that point, ascertain fully the cause of the break in the line, and if possible to restore the same. With this end in view I started on my mission up the river by steamer, taking with me a line repairer, a supply of wire and necessary tools. Reaching Bonne Carre, the captain in command of the cavalry, the same who was responsible for the guerilla story, in obedience to instructions, tendered me a cavalry guard to escort me to Donaldsonville, forty miles beyond, excusing himself, however, from accompanying the troop on the plea of a lame foot, and turning the command over to a junior officer. The situation was not without its element of humor, especially when the doughty captain offered to follow the cavalcade up the river on a gunboat, from which, in case of necessity, he might land and take active command. It is hardly necessary to add that he remained behind.

Our march was not without adventure, but nothing serious occurred. About two miles below Donaldsonville the wire trouble was located. About a quarter of a mile of wire had been cut out and the missing portion was nowhere to be found. Scouting through the neighborhood an old negro was come across who declared that an overseer of a near by plantation had cut the wire and thrown it into the river. The recalcitrant overseer was finally secured and sent to New Orleans. The break was, of course, soon repaired, and communication once more established between New Orleans and Port Hudson, a fitting celebration of the day, for it was on July 4, 1863.

Our return to New Orleans was accomplished on board the North America, formerly a passenger steamer on the Hudson, plying between New York and Albany.

When Port Hudson surrendered, the papers, etc., found in the commanding general's quarters were brought to New Orleans. I was enabled to select from among the budget of telegrams all that had any bearing on the famous raid of Colonel Grierson. These were mostly despatches from General Pemberton to General Gardner, notifying him of Grierson's start and daily progress as far as they could ascertain, with details of plans to intercept him and stop his career, all of which were unsuccessful.

The winding up of the file after Grierson's arrival at Baton Rouge was a despatch from Gardner to Pemberton, saying: "Grierson has arrived at Baton Rouge. How did he get through?" To which Pemberton very tersely replied: "I don't know. Do you?"

This correspondence was put in shape and sent to General Grierson, who sent me the following letter of thanks:

Headquarters, Cavalry Division,
16th Army Corps,
Memphis, August 17, 1863.

W. A. Sheldon,
Cf. Teleg'h Opr.,
New Orleans, La.

Sir:—Yours of July 16 enclosing telegraphic dispatches captured at Port Hudson has been received. Please accept my thanks for your kind consideration; they are, of course, highly interesting to me.

Respfly,
Your obt. servt.,
B. H. GRIERSON, Brig. Gen'l.

It was during the siege of Port Hudson and at the time an attack was made at Fort Butler, Brashier City and other points, and after two days and nights of continuous service, that I was awakened one night shortly after having turned in at midnight, wearied out after the long, sleepless vigil by heavy knocking at the door, accompanied by gruff orders to get up and send a message at once. These orders came from two aides of General Emory (who was commanding the city at that time), young gentlemen who doubtless supposed all that was necessary to do was to order the thing done and not how it was to be done. The point desired to be reached had no operator in attendance. No explanation could convince these young officers that it was necessary to have some one at the other end of the line to receive the message. They wanted it sent, and insisted upon it being done.

Some loud and hard talk followed, arrests threatened on the part of the officers, etc., and as the office adjoined my sleeping apartment I was for a time made prisoner with a sentry posted in the hallway.

When the facts came to the knowledge of General Emory later the same morning, the officers were made to realize the mistake they had made, and I believe the ears of those young fellows would tingle even now as they recall this interview with their commanding officer.

The Department of the Gulf was always short of operators. At no office was there ever more than one except at New Orleans, where Henry Stouder was for some months the only assistant I had. Finally another, a Mr. Fairchild, came out from New York, and he helped lessen the duty of work in that city. After the river was opened by the fall of Vicksburg and surrender of Port Hudson, two or three more operators were sent down the river and our work was no longer one of hard labor. Of these S. L. Griffin was sent to Baton Rouge and others to different points.

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Shortly after the middle of August, I went to New York to superintend the manufacture and shipment of some cable for the river at New Orleans, and just as this was completed and ready for shipment I was taken ill with typhoid fever, and when able to be about again tendered my resignation from the military service.

Speedy Telegraph Work at the Denver Convention.

The telegrapher was in evidence at the Democratic National Convention at Denver. This is what the Republican of that city had to say about some of the operators who were present on the occasion and of the records they made:

"Never in the history of Denver has the city contained, at one time, as many shining lights in the telegraphic profession as were serving the different press associations and telegraph companies at the time of the convention, and many records of long distance telegraphing have been broken. In one instance the world's record for fast transmission of press matter, even on short circuits, was broken on one of the Western Union wires between Denver and New York, a distance of over 2,000 miles.

"'Old Farmer' Lawton, who personally knows many of these men and has their record for fast work in the past, has been keeping tab on them to see what effect cool nights and sunny days would have upon their nerves.

"George W. Conkling chief operator for the New York's Sun's Laffan service, who holds more prizes for fast sending than any other operator in the country, was brought out by the Sun people to overcome the shortage of wires in the West. July 7 Mr. Conkling transmitted direct into the Sun office from Denver 14,740 words in three hours and twenty-three minutes, or an average of 2,739 words per hour, at most fifty words per minute. He kept up this average every evening until Friday, when just to show the boys that he still retained his old time grip and was not worried over a few days' hard work, he sent 10,370 words direct into the Sun office in three hours and twenty minutes, or an average of 3,100 per hour. Lawton thinks this record will stand for many years to come, and what pleases him is the fact that one of his old Denver-raised boys, Harry R. Clark, copied it in New York and has broken another world's record as to fast receiving. Some of the editors on the New York paper are old-time telegraphers, and for several minutes their own duties were stopped while listening to the wonderful rapid work.

"Lawton names the following men brought to Denver for the occasion who made enviable records during the convention: Paul Ende and Ed Lindley, of their Chicago Tribune force; A. J. Salack, W. H. Meacham, Fred Lesem and M. J. Dugan, of Chicago, and the noted W. L. Waugh, of New York, and J. Simmonds of the same place. For years operators all over the country took off their hats to Mr. Waugh, and he is just as nimble with the key to-day as he was when he made a world's record, after the assassination of President Garfield.

"Some more very rapid work, if not the fastest ever done for The Associated Press, was accomplished by George R. Allen, chief operator of that organization in Denver, and Ernest W. Emery, their chief operator at Washington, D. C., who was here handling The Associated Press bulletin service. They are two of the fastest men in the service and by relieving each other at intervals they kept up a speed that General Manager Melville E. Stone has heard nothing but the highest praise for from every large paper in the United States, that The Associated Press serves. Allen is a Denver-raised boy and Mr. Emery was one of the first men to copy The Associated Press for the Denver papers, back in 1879. J. J. Rafter, of The United Press of Chicago, was not here for the past good he had done, but to speed, and his perfect Morse was watched at every repeater station on their lines.

"Another fast man was Harry Hollingsworth, who was sent here in charge of the Hearst service and was not supposed to do any telegraphing, but after hearing that others were smashing all previous records, off went his coat, and for a few hours during one of the sessions, dots and dashes were shooting out of Denver at a speed that made Farmer Lawton wish he was not one hundred and fifty years old, so he could copy it. Denver, too, has some stars, but they did not go after any records. They will when the next convention comes to Denver."

Book Notices.

The "New Catechism of Electricity," by N. Hawkins, M. E., covers so wide a range in its consideration of the field of applied electricity, as to attach peculiar value and significance to the volume. Few there are, comparatively speaking, who are in a position to take advantage of the technical training afforded by special schools and the science departments of colleges and universities. The workship must of necessity continue in large measure yet to furnish and develop the electrician of whatever grade, of the future. Such a volume as the one under consideration affords a distinct help to the student and seeker after aid in electrical matters. It is a practical treatise prepared with especial care and knowledge of the subjects presented, by an author of extended reputation and versatile information, whose numerous educational works are well known. In its treatment it includes the dynamo and motor; wiring; the electric railway; electric bell fitting; electric lamps; electric elevators; electric lighting; electric plating; the telegraph and telephone; measurements, tables, etc. The book, which is abundantly illustrated, embraces nearly 550 pages, is bound in red durable leather with gilt-edged leaves—a handsome and substantial volume. It will be sent on receipt of price, $3, to any address, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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The Motor-Driven Wheatstone Transmitter.

BY C. C. VYLE AND E. V. SMART.
(In the Post Office Electrical Engineers' Journal, London.)

Wheatstone's automatic system is the best system in the world where the economy of line wire is concerned. Four hundred words a minute can be passed over the wire, as against about one hundred by the next best system. This means that three wires at least between the two stations are saved. When great pressure exists on a circuit Wheatstone working is resorted to. When a special event of any importance takes place it is the Wheatstone system that is used to dispose of the work. It is the Wheatstone system that transfers the news of the world from London to all parts of the United Kingdom. When a general breakdown occurs it is by means of the Wheatstone system that the work is disposed of over the few wires remaining. The Wheatstone system is to any keyboard system what our fastest express trains are to the old stage coaches. The staffs at both ends, one lot punching and feeding the transmitter, the other receiving the news and writing it up, soon dispose of the work. One drawback is the writing up of the slip, especially by artificial light; the constant transfer of the eyes from the moving slip to the writing and vice-versa, is a strain. This might be remedied by producing a slip, which, by being passed through another instrument, could be read by sound.

When required for retransmission purposes the slip might be gummed on a form. It would be as easy to send from the slip so gummed as from the written words. Much time might be saved by adopting the latter method. Again, instead of the present form of Wheatstone perforator a keyboard perforator would greatly increase the speed of punching. Enough has been said to show the great utility and supremacy of the Wheatstone system in circumstances when speedy transmission over the line wire is of the utmost importance.

Although many years have elapsed since Sir Charles Wheatstone introduced his automatic system, very little has been done to improve the transmitter, and it remains to-day practically as it was when first invented. The driving of the transmitter is a matter which has received a great deal of attention with a view to abolishing the use of the heavy weights at present used, and it is in connection with this subject that the present article deals.

It is now more than twenty years since the need of a motor-driven transmitter was first felt. When it was necessary to obtain high speeds, the practice was, and still is, to tie extra weights to the driving weight; this frequently ended in disaster and the suspension of work until a fresh transmitter had been obtained. The difficulty in obtaining high speeds was the prime cause of a motor-driven transmitter being sought, but many other reasons can be advanced for the demand. Some of these are; First, to obviate the need for weights (forty-five pounds each) and weight guards; second, to avoid transmitters "running down" during the transmission of messages, and the conequent confusion, loss of time, and repetition of work; third, to relieve the operator of the labor of frequent winding, leaving him free to attend to slips, etc; fourth, to minimize the liability to shocks. Shocks have occasionally been experienced by operators while winding transmitters. In this connection it may be mentioned that an extra terminal was recently provided on the transmitter for the purpose of connecting the framework of the transmitter to earth; fifth, to insure constant speed of the transmitter when used in connection with apparatus where "slowing down" or "racing," due to overwinding, results in malformation of the signals, rendering the slip unsuitable for retransmission or printing purposes; sixth, to prevent the cutting of instrument tables to provide for the movement of the chain attached to the weight.

When the need was first felt, an electrically-driven transmitter was designed, but this, in common with others since designed, did not give constant speed, and on this account the signals were unreliable. Other electrically-driven transmitters have been unsuitable, because, in arranging for varying the speeds of the motor by shunting some of the current, considerable overheating took place; they, too, were subject to the troubles of momentary racing and irregular running. Air-driven transmitters were also tried, but were unreliable, on account of the difficulty in maintaining constant pressure. The air actuated a fan that was attached to the driving axle.

The Hughes instrument is one to which motor-driving has been successfully applied, but in this case the instrument is driven at a constant speed and the work done is kept constant by means of a governor.

The requirements for a motor-driven Wheatstone transmitter are: First, it shall be capable of running at any speed required for Wheatstone circuits; second, it shall give constant speed when run at any given rate; third, the motor and controlling apparatus shall not overheat, and, fourth, the speed must be easily controlled.

Small motors with electrical governing, such as are required for Wheatstone transmitters, are not easy to design when all the requirements mentioned have to be met, and all attempts hitherto have failed. Mechanical means have been attempted, but have not, until the present instrument was designed, proved satisfactory.

Small motors to be efficient should have their armatures to revolve at constant high speeds. If the efficient speed of the motor be too high for the purpose required, it should be reduced by gearing. This is the fundamental principle of the motor-driven transmitter designed by the writers.

Choose a motor of sufficient horsepower to do the work easily and keep its speed invariable and high. With this explanation the description of the instrument should be easily followed:

A motor, 110 v. 1/16 horsepower (series wound, for a reason to be explained later) has a

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thick German silver plate fitted at one end of the axle; this, backed up and made rigid, is used as a friction plate. On the front of the friction plate rests the edge of a friction disc, consisting of two thicknesses of compressed hide held tightly between two metal plates. The metal plates are slightly less in size than the hide discs, to prevent the metal touching the friction plate.

The contrivance determines how the friction plate and disc are kept in firm contact. A ball is held to the end of the armature axle remote from the friction plate. A short piece of steel, each end of which is connected to the shell of the motor by a spiral spring, presses on the axle by way of the ball bearing. The friction plate might be kept to its work by the motor being so placed that the armature, in striving to get to its normal position when running, keeps the friction plate forced towards the disc. (When a motor is running, the armature, if free to do so, places itself in a certain definite position, and considerable force is necessary to move it from that position. If, now, the motor be so set, with respect to the friction-disc, that the friction plate just touches the disc and the armature is to the left of the position referred to, the force tending to bring the armature to the right will keep the friction plate up to its work.)

The friction disc is fitted on an axle, at one end of which is a pinion gear to which the driving axle of the transmitter is connected by means of a clutch; at the other end is a cup-like end into which fits a pointed termination of the adjusting screw, this latter being in alignment with the friction disc axle.

The method of varying the speed is on the well-known principle that the various parts of a revolving wheel have different speeds through space, e. g., any part of the periphery of a wheel travels much faster than a part near the centre. The adjusting screw pushing the friction-disc axle inwards, causes the friction-disc to be carried from the center to the periphery of the friction-plate, varying the speed from slow to fast in so doing. To vary from fast to slow, another property of a revolving wheel has been utilized. The upper half of a revolving wheel has a motion contrary to that of the lower half, and anything rubbing against the side of a revolving wheel, if free to do so, takes up the motion of translation of that part of the wheel on which it rubs. Assume the friction-disc to be placed in the left lower half of the friction-plate near the periphery. On causing the friction-plate to revolve in a non-clockwise direction, the friction-disc will travel toward the center.

When an ordinary transmitter is started on a quadruplex circuit, we find, owing to the comparatively slow arrival at its proper speed and the line being disconnected for comparatively long periods during the time taken, that the signals on the B-side are interfered with. With a series-wound motor-driven transmitter, the speed desired is obtained almost instantaneously on account of its great starting powers. The work for the motor-driven transmitter is practically constant, so that variation in speed due to variable work has not been allowed for; the friction introduced by the paper is negligible on account of the friction already present.

A dust-proof switch is used to start the instrument. This switch operating a bell crank lever connects the power leads to the motor, the batteries to the transmitter contacts, and also makes the connection through the transmitter as in weight-driven instruments.

The clockwork or front portion of the transmitter is attached to the driving portion by means of a clutch so shaped that the need for a given position to grip is obviated: it fits in any position. The connections are provided by means of buffer contacts. When the front portion is pushed into position, the contacts are securely made and a raised edge keeps the front pressed back. It is clamped by two plates and thumbscrews. The clockwork or train has been reduced to a minimum, the frame containing this portion being about one-half the size of that used for weight-driven transmitters. A change of transmitter can now be made very quickly. It has been demonstrated that the change can be made in ten seconds.

The instrument which has been described cannot be said to be a new instrument. A great deal of the valuable part of the weight-driven transmitter has simply been transferred to the motor-driven instrument. The instrument has been used recently in connection with some trials of the Wheatstone system between Edinburgh and London and has proved a boon to the operators, who speak highly of the relief afforded them.

Convention Conveniences.

At his farm in Lincoln, Neb., Mr. Bryan listened over the telephone to the speech putting him in nomination at the convention at Denver. At a distance of several hundred miles he could hear the proceedings almost as distinctly as if they were in the Lincoln Town Hall.

Mr. Taft enjoyed similar telephone and telegraph facilities while the Republican Convention was going on. So did President Roosevelt, who at the White House was able to direct what was going on at Chicago as quickly and as literally as if he were on the ground.

One of the first uses to which Morse's invention of the telegraph was put was for Silas Wright to telegraph his declination of the nomination for vice-president from Washington to Baltimore, getting it there in time for the convention to nominate George M. Dallas in his place. This was in May, 1844. Prior to the telegraph there was no opportunity for speedy consultation between an absent candidate and his friends at a national convention.

Telegraph Age is headquarters for electrical and telegraph books. Write for catalogue.

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Chicago Postal Notes.

The many friends of Mr. James E. Pettit, for twenty-three years past chief operator of this office, and the well-known military telegrapher, who served his country during the Civil War with conspicuous ability, regret that he has been compelled to resign on account of continued ill health. It is hoped that his restoration will be effected by a complete cessation from business cares.

General Superintendent W. I. Capen, Division Superintendent T. W. Carroll, and First District Superintendent H. G. McGill, were in attendance at Denver at the Democratic convention, their presence being to promote the interests of the company.

The following were detailed to Denver to render assistance during the convention: Chiefs G. S. Palmer, F. W. Hans, B. D. Seymour and Fred Smith; operators, C. G. Simpson, J. J. Walsh, W. B. McCreary, E. A. Glessner, W. S. Atchison, J. J. Brosnan, Chas. Dortmund, Glen Heath, E. E. Bruckner, E. E. Meredith, J. E. Maloney, W. J. O'Brien, H. L. Heisler, C. W. Foster, Dave Hamilton and A. B. Heiberg; from the general office R. H. Ahlers, A. R. McGrath and Robert Heath.

G. K. Smith was detailed to take charge of the temporary repeater plant at North Platte, Neb., during the convention; E. W. Blakely to Dodge City, and J. H. Sprague, to Omaha.

L. O. Short, who has been ill for several weeks due to nervous prostration, will in a few days be removed to his old home at Delevan, Ill.

Charles Reinert, night chief of the Metropolitan and an enthusiastic turner, is spending his vacation in Europe at the International Turn Fest.

J. P. Garrison, having recovered from an extended illness, occasioned by a broken limb, is again with us.

R. G. Harris, chief of the Rowland, has gone to his home at Baltimore, on a vacation.

A. G. Drake, A. O. Wilder, Fred Smith and H. H. Dengler have returned from their vacations.

New York Western Union.

Geo. L. Marshall, formerly of the operating department and lately located at Denver, Colo., has returned East, accompanied by his bride. Mr. Marshall has been assigned to the Eastern division.

Chief Operator T. A. McCammon of the general operating department, has returned to the city after enjoying an extended trip through Canada.

Mr. and Mrs. Rankin, formerly of Chicago, but more recently employed here, have resigned.

Mr. J. F. E. Hopkins, assistant wire chief, has returned after a sojourn in the mountains.

The following summer assignments have been made: Mrs. Ethel Curtis at Jamestown, R. I.; Miss May Dolan, at Shelter Island, N. Y.; Miss Blohm at Asbury Park, and Mrs. L. Kirschbaum at Hollywood, N. J., and Mr. E. Mesler at the State Camp at Sea Girt, N. J.

Telegraphers' Mutual Benefit Assessment.

Assessment No. 481 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of William H. Young, at Chicago, Ill.; Gustave M. Heiss, at Meridian, Miss.; William A. Morgan, at Lake Forest, Ill,, and George Doerr, at Chicago, Ill.

The Associated Press.

Mr. L. E. Ladd, Jr., has been placed in charge of the Atlanta office of The Associated Press. Prior to his appointment there Mr. Ladd was night editor of the east wire in the New York office. Arthur W. Copp, who was temporarily in charge of the Atlanta office, has been appointed correspondent at Salt Lake City.

The Associated Press papers in Kansas, Missouri and Oklahoma are receiving their reports over a newly formed wire cricuit. This circuit includes Joplin and St. Joseph, Mo., Leavenworth, Topeka and Wichita, Kans., and Guthrie and Oklahoma, Okla. It appears that in this way the association is able to handle items of more local interest to the immediate section concerned than before, when the circuit was made up through direct from Kansas City, Mo., to Salt Lake City, Utah.

Obituary.

Thomas T. Rabbitt, aged seventy-two years, a telegraph operator, died on July 14, at Washington, D. C.

Daniel G. Landager, aged fifty years, a telegraph operator at Cincinnati, O., died in that city on July 9.

Charles Moir, a Canadian Pacific Railway telegraph operator, was drowned at Medicine Hat, Assinaboia, Canada, on July 4.

John C. Witt, manager of the Postal Telegraph-Cable Company of Texas, at Houston, Tex., committed suicide on July 16, a result of several years of ill health.

Robert Yates, a member of the Telegraphers' Mutual Benefit Association, and a former employee of the Postal Telegraph-Cable Company, was accidentally killed on July 19, by being run over by a train on the Long Island railroad. His home was in Brooklyn.

Orders for books on telegrapny, wireless telegraphy, telephony, all electrical subjects, and for cable codes, will be filled by TELEGRAPH AGE on the day of receipt.

Mr. J. B. Bertholf, manager of the Jersey City, N. J., office of the Western Union Telegraph Company, is an old subscriber of Telegraph Age. A few days ago in again renewing his subscription, he wrote: "I hope I may be so fortunate as to continue doing the same for many years yet to come."

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Telegraphers Aid Society Statement.

The Telegraphers' Aid Society of New York makes the following statement for the quarter ended June 6, 1908.

Balance on hand, March 6, 1908		$21,148.56
Receipts		1,362.00
Total		$22,510.56
Disbursements.		
Sick benefits	$1,090.51	
Death	300.00	
Expenses	195.40	
		$ 1,585.91
Balance on hand June 6, 1908		20,924.65
Total		$22,510.56
Summary.		
Disbursements		$ 1,585.91
Reiceipts		1,362.00
Loss for quarter		223.91
Relief Fund.		
Balance on hand March 6, 1908		$ 4,069.72
Disbursements		147.84
Balance on hand, June 6, 1908		$ 3,921.88
Total		$ 4,069,72
Balances.		
Aid Society $20,924.65	On deposit	$24,714.92
Relief Fund 3,921.88	Cash on hand	131.61
Total $24,846.53	Total	$24,846.53

J. H. Driscoll, W. T. Rogers, F. J. Nurnberg, Auditors.

The Rowland Multiplex Printing Telegraph System.

At this time when approved systems of printing telegraph are engaging public attention, and a wide-spread desire is manifest to study more carefully the methods involved in all such both in respect to their mechanism and in results achieved, the columns of Telegraph Age habitually afford descriptive references frequently covering the detail of such subjects at interesting length and in illustrated form. Thus, several years ago, or to be more explicit, on September 16, 1903, this journal published a carefully prepared analysis, embracing six and one-half pages, illustrated with line drawings, of the Rowland Multiplex Printing Telegraph System. The article attracted much attention at the time, both at home and abroad, and ever since there has been a constant demand for the same. The edition containing the article was a large one and although the supply has been heavily drawn upon, there are about one hundred copies left which may be had upon request. Copies at twenty-five cents apiece will be sent to any address on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Notice.

Advertisers who use this special want column obtain excellent results therefrom. Frequently when expert help is required in any branch of the telegraph or allied services, as a rule the very best men available have been secured through the medium of this department. This has been so uniformly the outcome as alike to satisfy advertisers and please the publisher. Replies to advertisements coming as they do from all parts of the country, prove that these short, pithy advertisements catch the eye of thousands of readers.

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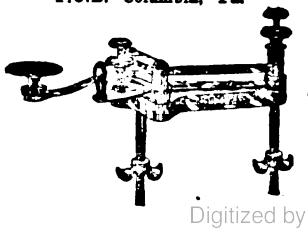

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Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

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Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

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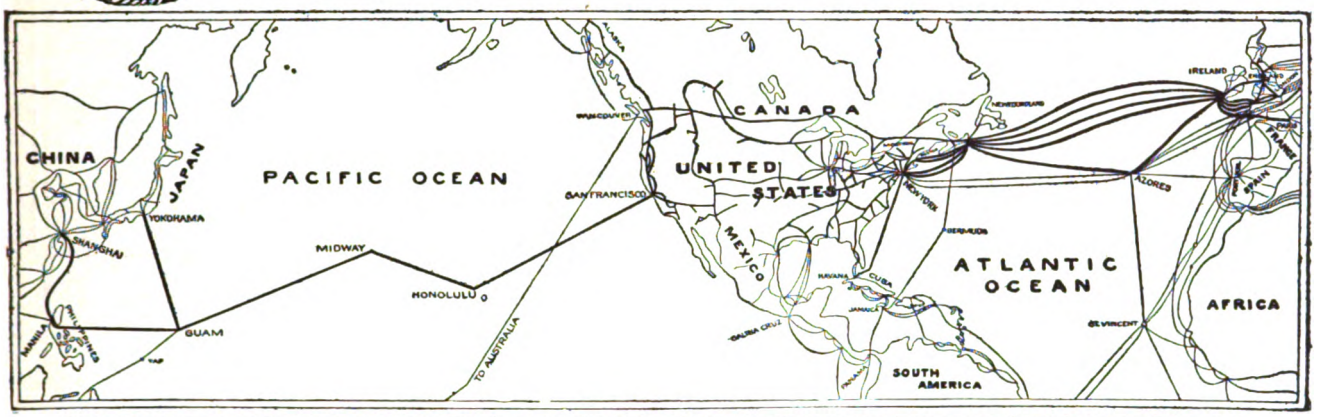

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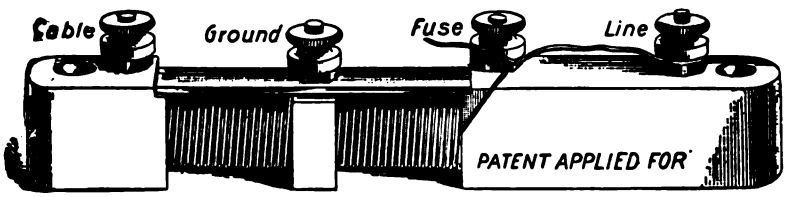

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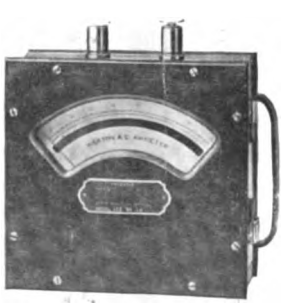

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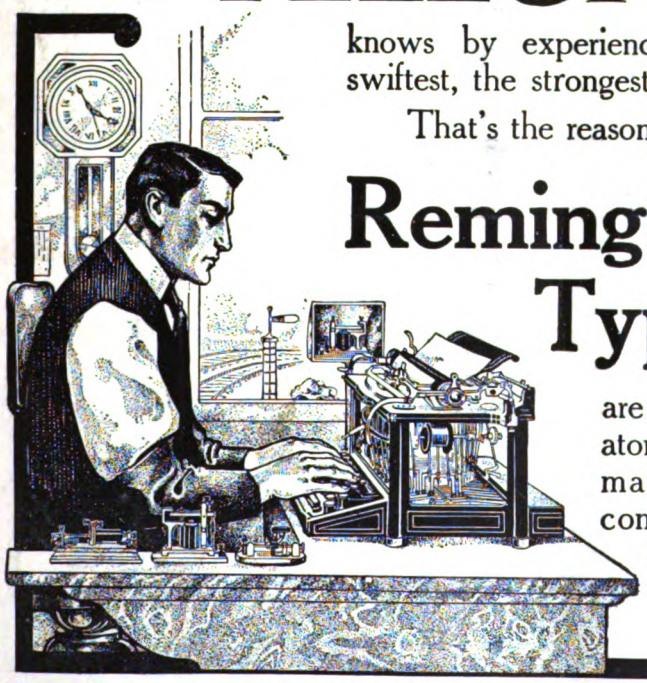

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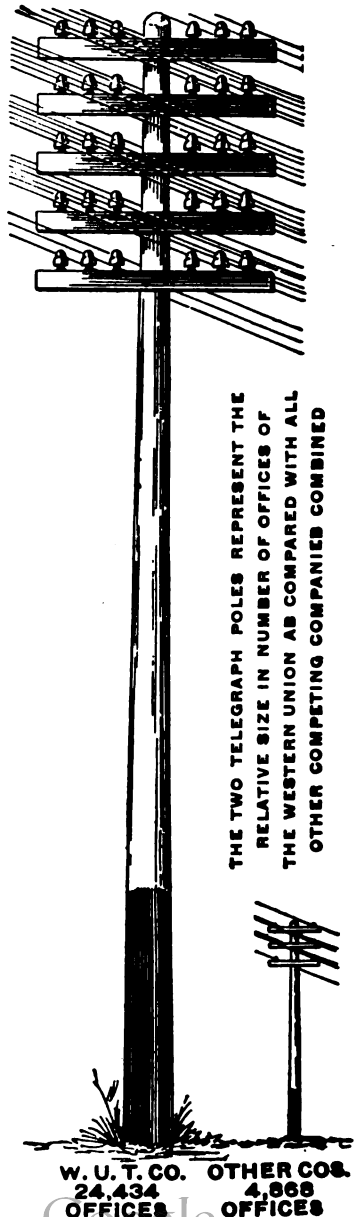

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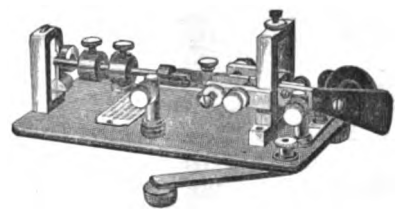

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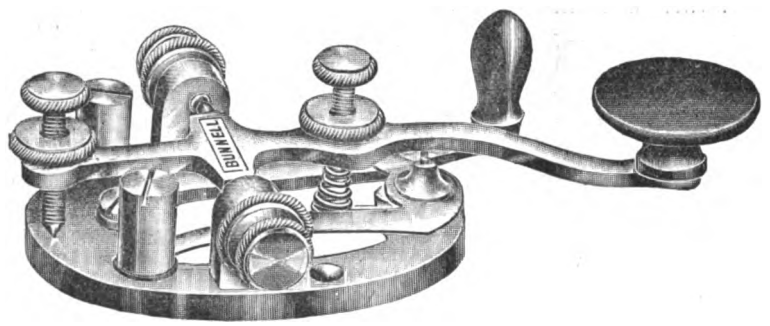

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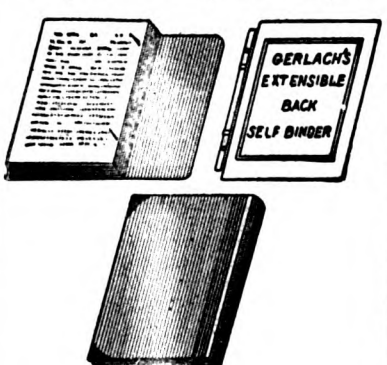

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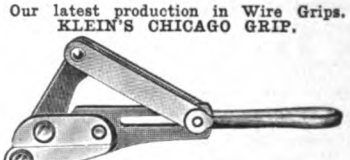

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SOME POINTS ON ELECTRICITY.

Current Volume in Divided Circuits.

BY WILLIS H. JONES.

The following inquiry from "J. D. B.," a Boston correspondent, is somewhat ambiguous as regards the kind of a circuit he refers to, but as the subject of current volume in divided circuits is an interesting one and often perplexes young electrical students we will use it as the basis for an article on that subject. Our correspondent writes:

Please state for the benefit of myself and a few interested beginners, the manner in which a given volume of current is made to divide and flow through a circuit in a given ratio. I know there is a rule for ascertaining this fact but cannot recall it.

In the pursuit of electrical knowledge, or for that matter, when seeking information on any subject, the conductor of this column has always found it helpful to study a writer who, while thoroughly in harmony with the standard text-books, at the same time is independent enough to break away from the conventional form and treat the subject from an entirely different standpoint. In this way he often clears the mental atmosphere and the reader, because obtaining a different view of the subject, overcomes doubt and perplexity.

To illustrate this point, let us recur to the subject of current flow in divided circuits. The conventional text-book manner of explaining what occurs in such circuits is in effect something like this: "A certain volume of current flowing through a wire or feeder will, when it reaches a point where it finds one or more channels of escape offered, divide between the various outlets, or side circuits, in proportions inversely as regards their respective resistances; and that the sum of the different volumes in the branch circuits will be equal to the original volume of current flowing through the feeder, as far as the first tap."

Now, while this statement is correct, as applicable to a divided circuit already established, it does not mean that in the event of the original resistance of a circuit being altered by the addition of a branch or leak, that the sum of the separate volumes of current then flowing therein will be the same as flowed through the original circuit, although it will equal the volume that reaches the point of division after the leaks have been added. In other words if a conductor carries, say, one ampere of current, you cannot add a leak to the circuit with the idea of getting, say, exactly one-half an ampere in each leg. If the respective resistances of the two legs or branch circuits are identical, each will be found to have more than one-half an ampere of current, because the total resistance of the circuit has been lessened and consequently draws more current from the battery.

These fluctuations in current value, due to alterations in a circuit, naturally perplex young students who sometimes interpret the conventional explanation literally and without qualification.

Another way to treat this subject, is to disregard the division of a given volume of current into different proportions altogether and look at it from the following standpoint:

The volume of current that will flow through any branch or leak, regardless of the volume that flows through the feeder, will be in accordance with Ohm's law $\frac{E}{R} = C$, where E will be the value of the electromotive force of the battery taken at the point where the branch or leak is connected to the main wire, and R is the resistance of the leak circuit.

No matter how many side circuits there are, this rule holds good for each and every tap that is made. If the taps were all made to the conductor at one point the value of E in volts would be the same for each circuit, but the volume of current each leg would absorb, would be governed by their respective resistances. If the taps were made at different distances along the circuit (ohmically speaking) the value of E, at each tap, would be different at the junction of each

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branch circuit. Hence as the initial value of the electromotive force of a battery falls from maximum to zero, in direct proportion to the percentage of the total resistance it surmounts, it follows that if it is desired to obtain a pressure of, say, 100 volts for a side circuit, where the initial electromotive force of the battery is 300 volts, we must insert twice as much resistance between the dynamo and the tap, as the joint resistance of the branch circuits beyond it amounts to. In this way the voltage, having overcome two-thirds of the circuit's ohmic resistance, will have dropped to one-third of its full value, or 100 volts.

Of course, this rule for regulating the value of electromotive force at any given point, is subject to the same qualifications as that which governs the constancy of the volume of current to be "divided" in the conventional explanation, viz., it is only true where the resistance of the circuit is of a constant value; that is to say, not subject to alteration through temporary removals of any of the branch circuits. The opening of a side-line will increase the value of the electromotive force at each remaining tap and consequently alter the volume of current therein. Possibly this view of the action, which occurs in a circuit, may not be any more explicit than the conventional one, but it, at least, shows why and how the results are accomplished.

When it comes to devising a means of alternately decreasing and increasing the volume of current flowing through divided circuits in a given degree or proportion, so that the resistance of the external circuit shall not be altered, such as that of the main and artificial line of a quadruplex circuit, we do not take any original volume of current into consideration and then attempt to divide it, but deal directly with electromotive force. We simply add a tap or leak to the circuit containing the required resistance, which in conjunction with another coil, called the "added resistance," as a side partner, will drop the value of the electromotive force of the battery two-thirds or three-quarters according to the ratio desired when the transmitter connects the combination in circuit.

As the temporary addition of this leak and assistant coil to the multiplex circuit must not alter the total resistance of the external circuit the respective values of the two coils must be made such that their joint resistance will be equal to the resistance of the multiplex circuit, as far as the tongue of the transmitter. As there is practically no resistance up to that point, except that of the battery, 600 ohms battery resistance has been made standard as the value of the permanent resistance in the circuit up to that point.

In order to ascertain the amount of resistance the leak and the added resistance coils each shall contain, in order to have a joint resistance of exactly 600, and at the same time drop the value of the electromotive force in a given ratio, we have the following formulas:

For the added resistance coil, B (R—1), where B-internal resistance of battery, and R, the ratio desired. Thus, where 600 is the battery resistance, we get: 600 B × (4—1) = 1800 ohms, when the ratio is to be 4 to 1; and 600 B × (3—1) = 1200 ohms for 3 to 1.

For the leak coil, $\frac{BR}{R-1}$

Thus $600\frac{B \times 4\,R}{4\,R-1} = 800$ ohms when the ratio is 4 to 1, and $\frac{600\,B \times 3\,R}{3\,R-1} = 900$ ohms for a 3 to 1 ratio. It will be seen that the joint resistance of both combinations, 900 and 1800, and 800 and 2400, is the same, viz., 600 ohms; and if you take any other value for the battery resistance and ascertain the required resistance of the leak and added resistance coils by these formulates their joint will always be equal to that of the battery resistance you decide upon, no matter what ratio is used.

Recent Telegraph Patents.

A patent, No. 894,044, for an electric selective system, has been granted Frank D. Pearne, of Chicago. Printing telegraph system, including various detail features.

A patent, No. 894,142, for a telegraph transmitting instrument, has been issued to Frederick H. W. Higgins, London, England. In a type-printing telegraph system in combination with a number of electrical circuits are intermittently moving means for carrying type in one of the circuits, printing means in another circuit, together with means for controlling the intermittently moving type means.

A patent, No. 894,143, for a perforating, punching machine, etc., has been awarded to Frederick H. W. Higgins, London, England. Associated with a number of key levers is a number of electrical contacts and electromagnetic punches, the depression of any key lever closing an invariable number of punches.

A patent, No. 894,165, for a telautograph, has been taken out by Foster Ritchie, of Acton, England. Has means for dispensing with the use of batteries, whereby a telautograph may be operated from any available current supply, whether direct or alternating. Makes use of an electric generator, the brushes of which are oscillated by the movements of the telautograph.

A patent No. 894,214, for telegraphy, has been granted Isidor Kitsee, of Philadelphia. The system is equipped with means to transmit induced true reversals and means to receive the same, the second means comprising a condenser inserted in the line, a shunt therefor, and a polarized receiver in the shunt.

The following patent has expired: Patent No. 457,239 for a printing telegraph held by H. Van Hoevenbergh, Elizabeth, N. J.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.
(Continued—Part V.)

THE TRANSMITTER.

This instrument, a front view of which is shown in Fig. 17, has been considerably modified of late years with the view of adapting it to the use of dynamo currents and other present day requirements. It therefore differs in its electrical details from those of the original apparatus, whose commutating arrangement for reversing the poles of a single battery has been replaced by a polechanging device constructed on the principle of the "walking beam" polechanger for effecting the reversals with separate dynamos.

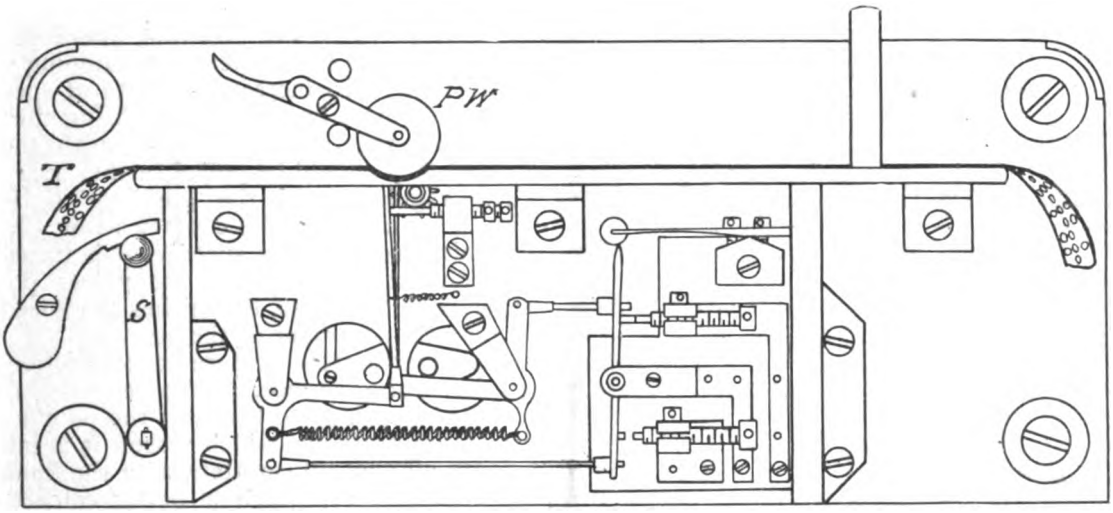

FIG. 17.—AUTOMATIC TRANSMITTER (FRONT ELEVATION).

The motive power for running the transmitter has also been changed to that of a small electric motor, by means of which a more uniform rate of speed can be maintained and the somewhat unsatisfactory operation of "winding up" entirely eliminated.

The motor is connected with a 110-volt source of current supply, a resistance of about eighty ohms being included in the circuit to reduce the potential to the required value.

The transmitter is now provided with a governor of the common ball type dependent upon centrifugal action for its operation. This device is seen to the left in Figs. 18 and 20 and is of such construction that when in the course of rotation the weights W.W.[1] (Fig. 18) overcome the tension

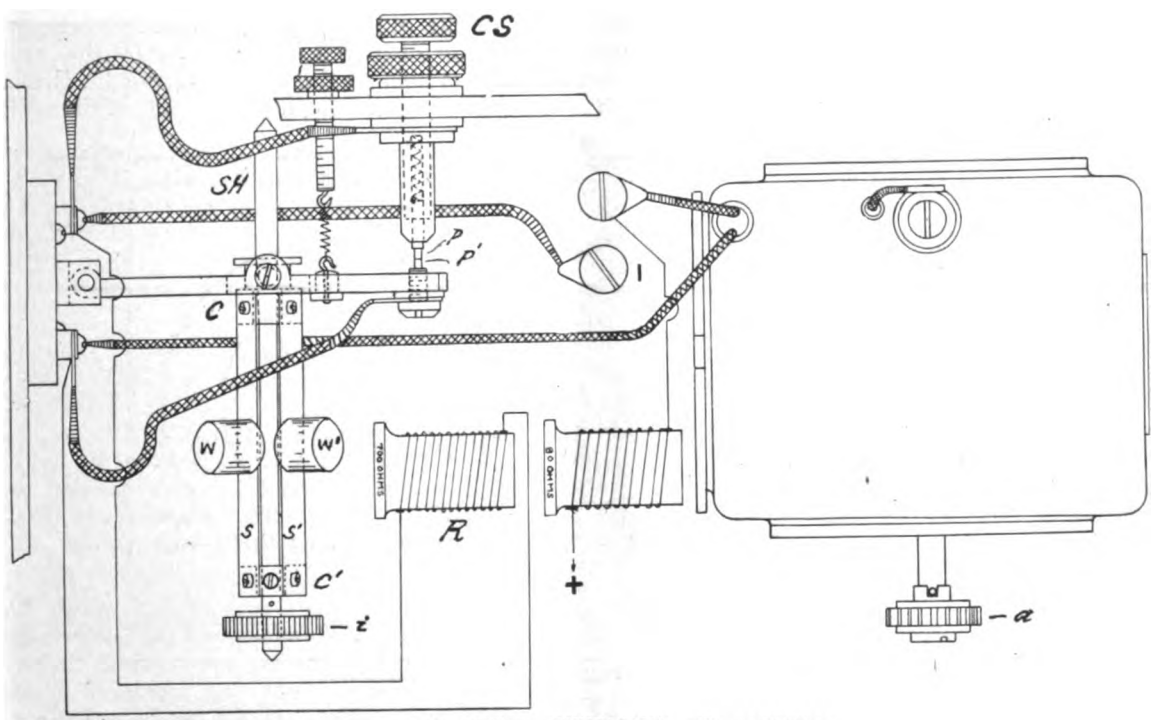

FIG. 18.—MOTOR CONNECTIONS AND GOVERNOR.

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of the springs s,s¹ to which they are fastened, the the contact point p,p¹ (through which the motor current normally flows) are forced apart, thereby

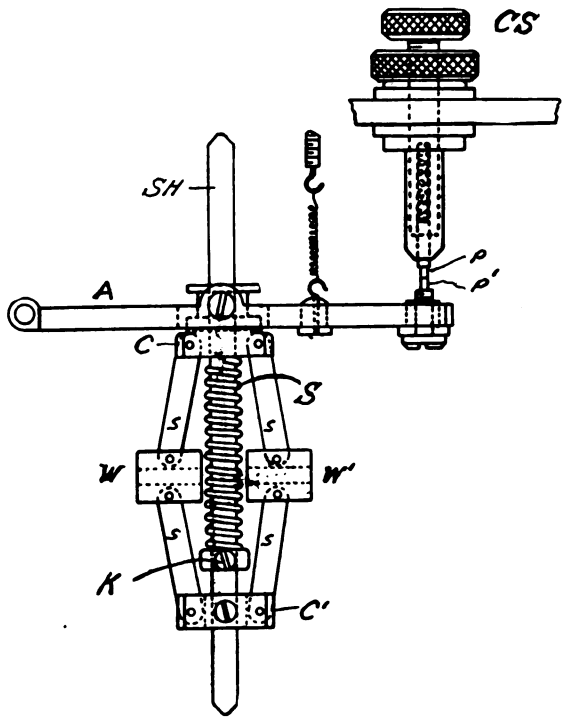

FIG. 19.—TRANSMITTER GOVERNOR (NEW STYLE).

throwing the resistance coil R in series with the motor windings and reducing the speed of the motor. When the contact points come together by reason of the diminished speed, this resistance is shunted out of the motor circuit, through which an increased current then flows causing the motor to speed up again. The points are, in fact, in a more or less continual state of vibration while the transmitter is running, and the variable resistance thereby introduced in the motor circuit tends to compensate for voltage variations or other irregularities, and to maintain the uniformity of speed so desirable for automatic work.

For obtaining any desired definite rate of speed certain preliminary adjustments of the springs s,s¹ (Fig. 18) can be made. The ends of these springs are mounted on collars C and C¹, one of which (C) is free to move lengthwise on the shaft (SH) as the governor operates, while the other (C¹) is set by means of clamping screws on the shaft. To increase the rate of speed the adjustment must be such as will bring these collars closer together, and to diminish the rate of speed they should be pulled further apart.

The regulation of the governor is further effected by means of the contact screw CS (Fig. 18) which increases the speed as it is turned in a direction tending to bring the points p p¹ together, and, of course, diminishes the speed with the reverse movement of the screw.

One objectionable feature in connection with this form of governor, is the tendency on the part of the springs to break at the points of fixture to the shaft, for which reason it is intended to equip all new transmitters with the kind illustrated in Fig. 19, which is better calculated to withstand the mechanical strains to which the device is subjected.

The same principle is involved in this arrangement as in that of the older form, and its method of operation is practically identical therewith. The improvement consists in substituting the flat rigid steel strips (s, s, s, s,) for the flexible springs used in the old style of governor. These strips, as will be observed, are hinged to the weights W, W¹, as also to the collars C and C¹, the latter being firmly fixed to the shaft SH, while collar C works loosely upon it under the combined action of centrifugal force and the tension of the spiral spring S.

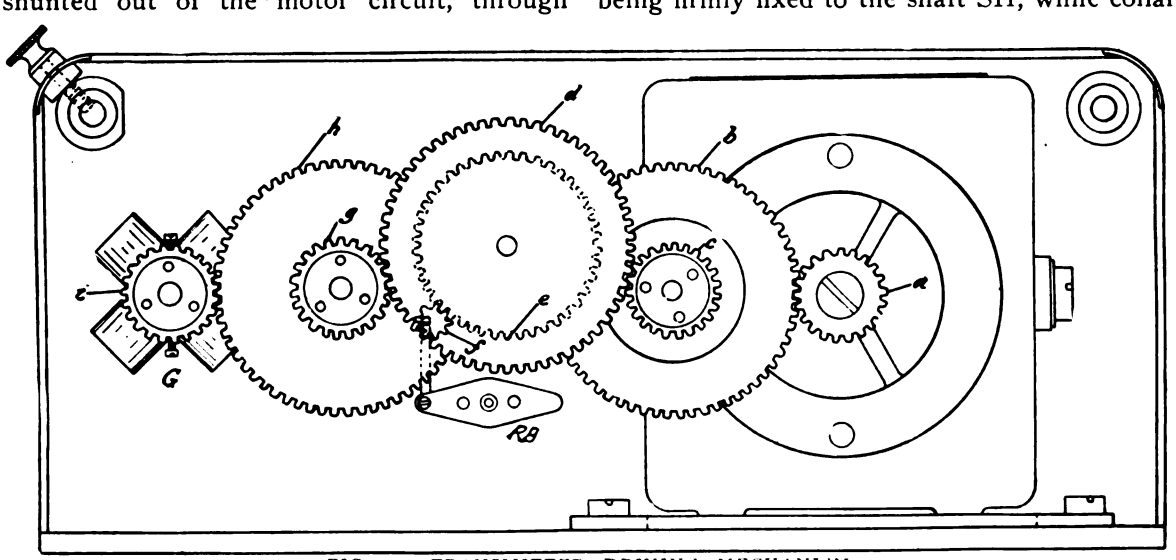

FIG. 20.—TRANSMITTER DRIVING MECHANISM.

In endeavoring to secure any different rate of speed than that to which the governor is origin-

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ally set (approximately 100 words per minute) the following course of procedure should be followed:

First adjust the contact screw CS in such manner that the free end of the arm A shall occupy a position midway between its limiting movements. Then unloose the set screw (k) and push the spiral spring (S) in the direction of collar (C) if the speed is to be increased, and in the reverse direction if it is to be decreased. Any nicer degree of speed variation that may then be desired can be brought about by adjustments of the contact screw (CS).

As will be seen by reference to Fig. 20 the transmitter driving mechanism consists of the motor gear (a) which meshes with a friction idler gear (b) and thus transmits the propelling motion to the series of other gears (c, d, e, f, g, h, i,) through the instrumentality of which the governor (G) and rocking beam (RB) are brought into action.

Under the old arrangement of working this mechanism was normally idle, and only set in motion at such times as a slip was ready to run through the transmitter. Now, however, the mechanism is kept in constant motion during business hours, and an arrangement has been made whereby the starting or stopping of the punched tape through the transmitter can be effected more advantageously than under the old conditions. The improved method is such that when the switch S (Fig. 17) is thrown into its normal position (or to the left of that shown in the figure) the paper wheel PW (which had previously been bearing upon the punched tape T, as it passed through the transmitter) is raised from the tape which instantly comes to a stop, to be as quickly restarted at the same speed upon reversing the position of the switch.

(To be continued.)

Personal.

Mr. E. O. Munson, formerly of the sales department, has been appointed assistant advertising manager to Mr. H. C. Slemin, of the Stromberg-Carlson Telephone Manufacturing Company, Rochester, N. Y.

Mr. John H. Cox, cashier of the Western Union Telegraph Company at Cleveland, O., who is prominent in political circles in that city, has been elected president of the Cuyahoga County League of Republican Clubs. The Cleveland Leader in referring to the matter prints a picture of Mr. Cox.

Mr. J. E. Dunning, of Paterson, N. J., a well-known old time telegrapher, now retired, is spending the summer at North Asbury Park, N. J., in company with his wife and a married daughter and family, from Bound Brook, N. J. H. W. Dowling, Western Union traffic manager at Washington, D. C., accompanied by his family, was also a recent visitor at North Asbury Park.

An enormous amount of telegraph press matter was handled at Quebec previous to and during the time of the Tercentenary celebration. The Great North Western Telegraph Company established a special office in the Court House that city, for the exclusive use of newspaper correspondents and the military contingent. This was placed under the direction of J. G. Davies, manager of the Ottawa office, and here during the time referred to an operating staff of ten men were kept busy. Manager Davies, together with Mrs. Davies, were participants in numerous of the social functions incident to the occasion.

Mr. Charles H. Schermerhorn, for thirty-eight years manager of the Western Union Telegraph Company, at Plainfield, N. J., as well as serving Central Railroad of New Jersey interests, has been retired on a pension, granted jointly by these companies. He is seventy years of age. While yet a young man, and after several years of telegraph service elsewhere, he came to New York in 1853, and was placed in charge of the telegraph office located in Barnum's Museum, situated then at Broadway and Ann street. Subsequently he was made manager of the Brooklyn office. Mr. Schermerhorn is succeeded at Plainfield by Michael L. Griffen of that city.

The Western Union Telegraph Company.

EXECUTIVE OFFICES.

The Barclay printing telegraph system is being installed in the Nashville, Tenn., office, for communication with various points in the radius of which Nashville is the center. This system, it is interesting to note, is now handling upwards of twenty million messages a year in this country, a remarkable development, which has occurred during the past twelve months.

Belvidere Brooks, general superintendent of the Eastern division accompanied by his family, lately visited Newport and other watering places on the New England coast, making the trip on his yacht "Wacoutah."

Mr. A. G. Saylor, assistant general superintendent of the Eastern division, accompanied by Mrs. Saylor, is spending his vacation on an extended automobiling trip, visiting various points in his division.

Mr. George H. Fearons, general attorney of the company, who has been absent in Europe for a number of weeks, accompanied in his trip by his wife and son, has returned.

Mr. Henry D. Estabrook, solicitor of the company, is in Seattle, Wash., whither he has gone to attend a meeting of the American Bar Association.

Mr. George W. Brownson, manager of the Kansas City, Mo., office in spending his vacation, is dividing his time between the home of his parents in Toledo, O., and making extended trips around the lakes.

Mr. J. E. Palmer, formerly chief operator at Reno, Nev., is now with this company, at Ashland, Ore.

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Postal Telegraph Cable Company.

EXECUTIVE OFFICES.

Mr. E. J. Nally, vice-president and general manager of the company, is again at his desk, after a vacation of three weeks spent in the mountains of Pennsylvania, his wife and children accompanying him.

Mr. Charles C. Adams, second vice-president, who with his family has been enjoying a visit to various points on the New England coast, is now in the Berkshires, and later will continue his trip to the Pennsylvania mountains, from whence he will return to the city.

Vacation days are being observed by other members of the executive staff, the latest absentee being Mr. Charles P. Bruch, the third vice-president, who is summering at Glen Cove, Long Island. His favorite recreation is yachting which he enjoys to the full on the Sound. Another who is about to leave, is Minor M. Davis, electrical engineer of the company, who will remain quietly at his home in Brooklyn, diversifying the time by frequent runs down on Long Island.

Mr. J. F. Skirrow, associate electrical engineer, and F. E. d'Humy, assistant electrical engineer, are again in harness, returning brown and much refreshed from their outing.

Mr. Harvey D. Reynolds, superintendent at Buffalo, and president of the Old-Time Telegraphers' and Historical Association, was a recent visitor.

Mr. J. H. Dorsey, assistant chief operator, at the Los Angeles, Calif., Postal office, has returned to duty, from his recent illness. In writing Superintendent Charles L. Lewis, at Los Angeles, Mr. Dorsey says, incident to his recovery: "I wish to take this opportunity of thanking you, and through you, the Postal Telegraph Employees' Association for the sick benefit which I received to-day. It is very acceptable and most highly appreciated, not alone for itself but for the generous and kindly spirit manifested governing its payment."

This company is fitting up a new main office at Augusta, Ga., on Broad street, near the present office, the work being done under direction of division electrical engineer **J. P. Edwards.**

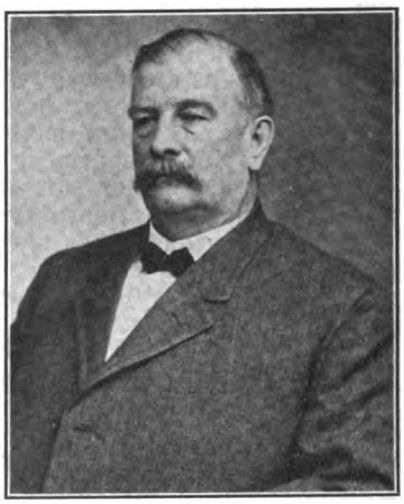
The office at Ashland, Ore., is being rewired, and dynamotors are being installed in place of Callaud battery, under direction of division electrical engineer H. C. Shaw, of San Francisco. Ashland is the repeater station between San Francisco and Portland, Oregon.

During the convention at Denver, several quadruplexes were successfully operated between Denver and Chicago, a distance of over 1,000 miles. Mr. J. F. Looney, division electrical engineer at Chicago, is entitled to credit for the success of this long distance quadruplex work.

Mr. J. D. McClelland, manager of the Postal Telegraph-Cable Company of Texas, at Shreveport, La., has been appointed manager of the same interests at Houston, Texas, vice J. C. Wyatt, deceased.

F. N. Roberts, Postal Chief Operator at Chicago.

Frank N. Roberts, who has been appointed chief operator of the Postal Telegraph-Cable Company, at Chicago, is a native of Blairsville, Pa., where he was born in 1857. His connection with the telegraph dates from 1873, when he became an operator for the Allegheny Valley Railroad Company at Franklin, Pa. Subsequently he served the Union Pipe Line and the Atlantic and Pacific Telegraph Company in Pennsylvania, afterwards making a brief stay in Buffalo, N. Y. In 1881 he reached Chicago, there first entering the service of the American Union Telegraph Company, and later that of the Western Union. From 1883 to 1886 he was in the employ of the Baltimore and Ohio Telegraph Company, gaining promotions therein to the positions of night chief operator and chief operator. During a part of 1886 and 1887 he served as a broker operator, but owing to the failure of the house he was with, he obtained a position as an



FRANK N. ROBERTS,
Chief Operator, Western Union Telegraph Company, Chicago, Ill.

operator with the Postal company. In this service he has since remained, his proved abilities and attention to duty securing him steady advancement, his successive promotions being to that of assistant wire chief, wire chief, assistant chief operator and now to that of chief operator itself.

E. W. Miller, Postal Chief Operator at Philadelphia.

Earl W. Miller, lately appointed chief operator of the Postal Telegraph-Cable Company, at Philadelphia, is a young man to hold so important a position. Born at Royersford, Pa., in 1883, he is now but twenty-five years of age. He began his telegraphic career as a messenger boy in 1897, for the Philadelphia, Reading and Pottsville Telegraph Company. Acquiring the ability to telegraph he was appointed an operator for that company in 1900, a position he held until given a place as operator with the Postal company in 1903. A year later he was

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promoted to be assistant wire chief, which, with the exception of a short service with the American Telephone and Telegraph Company, breaking into

EARL W. MILLER,
Chief Operator, Postal Telegraph-Cable Company, Philadelphia, Pa.

an otherwise continuous record at this post, he was recently advanced to the office of chief operator. Mr. Miller has made telegraphy the subject of careful study, applied electricity in all its forms engaging his attention, and he brings to his present position a mind well stocked with information and practical experience unusual in one of his age.

The Cable.

Cable communication was interrupted Aug. 12 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzorote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

The Nantucket cable, owned by the Martha's Vineyard Telegraph Company, which has been interrupted since last November, has been repaired by the cable tug "Western Union," thus restoring wireless communication with the Atlantic steamers via Nantucket.

The Central and South American Telegraph Company's twin-screw steamer "Guardian," built in 1907, is stationed at Callao, Peru. She is one of the most modern cable steamers afloat; her extreme length being 293 feet, breadth 36 feet, with a deadweight capacity of 1750 tons, and a draught of 18 feet. She is equipped with the most modern picking up and paying out machinery and gear, and has a speed of twelve knots per hour.

Thomas Ellis, employed by the Direct United States Cable Company at their Halifax, N. S., station, died on August 2. He went off duty at three o'clock on the afternoon of that date and fifteen minutes later, while walking in the direction of his home he was attacked by heart disease and dropped dead in the street. Mr. Ellis was forty-nine years of age and leaves a wife and six children. Many years ago he worked at the company's station in Ireland and later at the Tor Bay, N. S., office, removing to Halifax about twenty-two years ago when the cable station was transferred from Tor Bay to that city.

The Mexican Telegraph Company is the owner at the present time of two cable steamers, both of which are, now in the port of New York. One of these is the "Relay," which formerly belonged to the Central and South American Telegraph Company, and was built in 1890. She is 240 feet in length, 32 feet beam and has a registered gross tonnage of 1181. She has recently been thoroughly overhauled in New York and is to-day one of the finest cable steamers on the Atlantic. Her berth is at the Hoboken Land and Improvement Company pier, foot of 15th street, Hoboken. The other vessel is the "Mexican," which for many years has repaired cables in the Atlantic and Gulf of Mexico. This vessel is now for sale. She recently repaired the Western Union cable off Halifax, and is now berthed at Atlantic Basin, Brooklyn.

Convention of the International Association of Municipal Electricians.

The International Association of Municipal Electricians will meet for its thirteenth annual convention at Detroit, Mich., on Wednesday, Thursday and Friday, August 19, 20 and 21, making its headquarters at the Hotel Pontchartrain. Preparations for this event have been going actively forward, and a numerous gathering is anticipated. Considerable business of importance will be transacted, and a number of interesting papers, the titles of which have already been published in Telegraph Age, read. The officers of the association are R. A. Smith, president, Norfolk, Va.; J. B. Yeakle, first vice-president, Baltimore; B. A. Blakey, second vice-president, Montgomery, Ala.; C. F. Gall, third vice-president, Louisville, Ky; Charles S Downs, fourth vice-president, Altoona, Pa.; Frank P. Foster, secretary, Corning, N. Y., and C. E. Diehl, treasurer, Harrisburg, Pa.

The decision to hold the convention this year at Detroit, was influenced very largely by the very cordial letter received from William B. Thompson, the mayor, read at last year's meeting, inviting the association to that city, and tendering its hospitalities to the electricians.

Dominion Telegraph Company Elect Officers.

At the annual meeting of the Dominion Telegraph Company, held recently in Toronto, T. Swinyard was re-elected president; Sir Henry M. Pellatt vice-president, and F. Roper, secretary-treasurer. Including the officers the directors are: A. G. Ramsay, T. F. Clark, C. O'Reilly, R. C. Clowry, B. Brooks, A. E. Jarvis.

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Radio-Telegraphy.

J. D. Oppe, general manager of the Marconi Wireless Telegraph Company, of Canada, has resigned.

Mr. Austin F. Parkhurst has charge of the wireless telegraph station for the United Fruit Company at Swan Island, distant five hundred miles from Key West, Florida. This station has no difficulty in communicating with points within a radius of five hundred miles.

A patent, No. 894,317, for electrode for electrolytic or liquid oscillation detectors for wireless telegraphy, has been awarded Lee De Forest, of New York. Includes a flat plate of conducting material fused into a glass receptacle and having special structural characteristics.

A patent, No. 894,318, for an aerophone, has been issued to Lee De Forest, of New York. A system whereby two moving trains, each provided with transmitting and receiving systems, may each communicate warning or direction indicating signals. Operates by wireless emanations between the trains.

A patent, No. 894,378, for wireless signaling apparatus, has been taken out by Lee De Forest, of New York. Includes a plurality of wave producers each having a period differing from the others, and a receiving apparatus having a plurality of supplemental wave responsive devices, and an indicating device connected with all of said wave responsive devices.

The Berlin Convention of November 3, 1906, with the Protocol, etc., has been ratified by the Governments of Germany, Belgium, Brazil, Bulgaria, Denmark, Spain, Norway, Holland, Roumania, Sweden, Japan, Mexico and Great Britain, and by the latter country also on behalf of Canada, Australia, New Zealand, Cape Colony, Natal, Transvaal and British Indies, and its other colonies and protectorates.

In Paris a new wireless telegraph station is in process of erection, on the Champ de Mars in which the apparatus will be so powerful that it is hoped eventually a message may be sent from it direct to New York. The station itself is underground, its place marked only by four poles which support wires running to the summit of the Eiffel Tower, which is used as an electrical conductor. The extreme height of the tower will enable the transmitters to send messages a very long distance. The new station was built by order of the Army and Navy Department as a consequence of the fine results obtained in sending wireless messages between the army in Morocco and the Presidential fleet in the Baltic. General Picquart, Minister of War, and M. Thomson, Minister of Marine, are directly responsible for the undertaking. Captains Ferrie and Frac will be in charge, and the station will be opened in January. The former Eiffel station had only 10-kilowatt power and could communicate only as far as Morocco, on the one hand, and Nova Scotia on the other, but the noise of the spark could be heard clear across the Seine. The French recently decided to increase the station's power to 30 kilowatt to communicate with New York City. If they kept the larger station on a level with the ground, its sparking would have annoyed all Paris. The buildings would also have spoiled the scenic effect of the Eiffel Tower's graceful base. So the government decided to put the station under ground. The superstructure of wiring—or antennae—will be led up to the top of the Eiffel Tower, as before, by means of a chimney.

Business Notices.

The Kellogg Switchboard and Supply Company, Chicago, has recently issued a bulletin describing their railway despatching system; also a bulletin describing the new Kellogg Railway Pole Telephone, with supplements giving account of Kellogg railroad systems in successful operation. Some of the advantages of the Kellogg train despatching systems are the safety, care and rapidity of train handling; the selective signaling of any or all stations and the services of telegraphers done away with. Experienced train men who have inspected the Kellogg railway pole telephone in actual service, say that its reliability, simplicity and accurateness are its strongest features.

W. R. Ostrander and Company, of 22 Dey street, New York, manufacturers of telegraph instruments and of other electrical goods, have issued their new catalogue—the fifteenth consecutive edition. The care with which it is compiled, is abundently shown in its well-edited pages, indicating by illustration and description, including price list enumeration, the enormous number of specialties manufactured and handled by this firm. The detail entering into all this collation may be judged by the fact that the volume contains nearly 700 pages. The general index and that of catalogue numbers, is most complete, and indicates much careful work. It is a catalogue that a big electrical manufacturing concern may well be proud of.

Glass Telegraph Poles.

Europe is now beginning to use glass telegraph poles, remarks an exchange, and patents have been granted in Germany and the United States, for a machine to be used in their manufacture. The poles are said to be especially valuable in countries where wooden poles are quickly destroyed by insects or by climate. The Imperial Post Department of Germany, it is said, has already ordered that these poles be used in its telegraph or telephone lines. The poles will be more sightly than the present wooden affairs, and in countries where the forests are nearly exhausted, they will lessen somewhat the great drain upon the rapidly vanishing forests.

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The Cable of Fifty Years Ago.

Fifty years ago, on August 5, 1858, the first Atlantic cable was successfully laid. The New York Evening Post of that date printed the following leading editorial of the event:

Such (the landing of the cable) is the startling intelligence which reaches us just as we are going to press. We find it difficult to believe the report, for recent events have prepared us for a very different result, and yet the dispatch comes to us through our regular agent, who would not deceive us. He may have been imposed upon, but that is quite unlikely. If the few coming hours shall confirm the inspiring tidings, and the cable is landed and in working condition, all other events that may happen through the world on this day, will be trifles.

To-morrow the hearts of the civilized world will beat to a single pulse, and from that time forth forevermore, the continental divisions of the earth will in a measure lose those conditions of time and distance which now mark their relations one to the other. But such an event, like a dispensation of Providence, should be first contemplated in silence.

The news, the importance of which William Cullen Bryant thus described, remarks the Post in its present day comment on the occurrence of half a century ago, was promptly confirmed by Cyrus W. Field himself. He had landed from the American frigate Niagara at Trinity Bay, Newfoundland, on the day before, and the end of the first Atlantic cable was soon ashore. The public did not restrain its joy or obey Mr. Bryant's mandate. The cable is laid! The cable is laid!' The village Stockbridge, Mass., where Mr. Field's family was, on the receipt of the news, "bells were rung, guns fired; children let out of school shouted, 'The cable is laid! The cable is laid! The village was in a tumult of joy." But not until the 16th of August did the real celebration begin, for the first message, from Queen Victoria to President Buchanan, did not arrive until then. That was a signal for New York to outdo the joy of the Stockbridge school children. The church bells rang, factories blew their whistles, the river front was illuminated by fireworks and bonfires, the Everett House displaying no less than 1,000 lights; there were transparencies everywhere, and finally the City Hall capped the climax by catching fire. There was a great procession, too, headed by the Central Park police, and including eleven hundred laborers and eight hundred carts from the Park and the Croton Reservoir, then in process of construction, all led by Messrs. Olmstead, Waring, Miller, and Grant. Altogether, the procession was three miles in length, and was properly reviewed at the City Hall by Mayor Tiemann. As it passed the Metropolitan Hotel, a Waldorf-Astoria of the day, its members read this sign:

MARRIED, AUGUST, 1858,
BY
CYRUS W. FIELD,
OLD IRELAND AND YOUNG AMERICA.
"May their honeymoon last forever."

Mr. Field was well entitled to all the praise showered upon him. He had been scoffed at, ridiculed, dubbed a crazy man, had sacrificed his business and his own means, and had previously made two attempts to lay the cable, only to be thwarted. But as John G. Saxe put it in the jingle which appeared on September 11, 1858, in "Harper's Weekly":

Twice did his bravest efforts fail,
And yet his mind was stable;
He wa'n't the man to break his heart
Because he broke his cable.

"Once more, my gallant boys!" he cried;
"Three times!—you know the fable"—
("Ill make it thirty," muttered he,
"But I will lay the cable!")

Unfortunately for all the rejoicings, for some unknown reason, the cable stopped working just at the time of the great official celebration in Trinity Church, and of the dinner of the Common Council to Mr. Field, at which there were served no less than eighteen entrees in addition to five roasts, boiled turkey and mutton and full thirty-nine desserts—New York's City Fathers were generous in those days! Not until after this gorgeous and barbaric function did the sad news come that this was but a fleeting triumph.

For Mr. Field this meant doing the work over again. The old company had exhausted its means, which were gone for all time; a new one had to be formed and fresh capital raised. There were endless trips to be made to the other side, his business again had to be neglected, and finally abandoned. The Civil War came, next; but this proved a help rather than a hindrance, and Mr. Field's alert brain made the most of it. He suggested cables between the Union posts in Charleston harbor; he pointed out how the existence of a cable would have robbed the Mason-Slidell crisis with England of much of its danger and made of it an incident of days instead of months, without the consequent ill-feeling and heavy expenditure on the British side for war preparations. Mr. Field did yeoman's work, too, in upholding the cause of the North in England when it was highly unpopular, and began a friendship with Gladstone to put the case of the North before him as strongly as possible. But his main efforts were devoted to the laying of a cable that would work, and this he finally accomplished, by the aid of the Great Eastern, on September 8, 1866, after another failure in 1865.

It is hard for the newspaper reader of to-day, or the merchant, to realize what he owes to the cable, or to gauge the thrill that went through the whole world just fifty years ago. The Atlantic crossing of the first ocean steamship was the only event to which the press of 1858 could liken the opening of the cable. But in our time great inventions have followed so closely on one another's heels that the discovery of wireless telegraphy is but a week's wonder, and evokes no municipal dinner or civic parade. Even the news of the record-breaking flight of the Zeppelin airship, which, despite its tragic ending, may figure in history as the real beginning of man's conquest of the air, is accepted, with the telephone and a hundred other conveniences, as merely another and well-discounted triumph of science. The world should never forget its debt to the pioneers, those like Cyrus W. Field.

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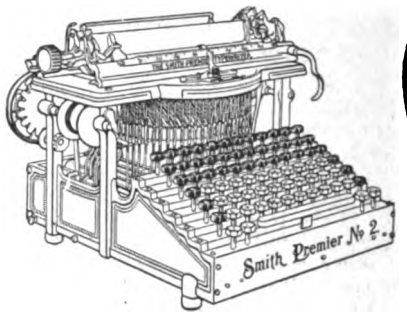

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AUGUST 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Telegraph Age at $2 a year.

In the twenty-five years that Telegraph Age has been published, it has been furnished at the regular subscription price of $1.50 a year. We feel confident that our readers will admit that this paper has steadily advanced in interest and value to the profession it aims to serve, during this quarter of a century, and that this improvement has been especially manifest of late years. Many, indeed, write in a complimentary tone to tell us so, all of which is most gratifying, for the production of the paper has alike demanded and received the best thought and painstaking effort on the part of its conductors. Nothing else, we are confident, would satisfy the class of readers whom we now have registered on our subscription books, and who are located in all parts of the world. We may be pardoned for expressing the pride we naturally feel in this journal which in its constant progress, weathering all storms, has developed, expanded and shown independence in its impelling motive to provide a first-class and helpful telegraph paper. And we hope we may be further exonerated from all egotism when we put forward the claim that the paper is to-day serving the best interests of the telegraph, as it understands them to be. For it presents in each issue an amount of technical matter of a character calculated to afford practical help to every one engaged in any form of telegraph service, whether employed in this country or abroad. Not only this, it discusses and otherwise reflects in original and contributed matter, and in carefully selected miscellany, current news and the most enlightened mention respecting the telegraph in every phase of its many-sided relationships. That Telegraph Age is of interest to its readers is explained in a word—it is in vital touch with them. It is a telegraph newspaper in the best sense of that understanding, and as such it has no competitor in the world. Its worth is recognized by all foreign governments inasmuch as their departments of telegraphic administration take the paper for the broad scope of its information and progressive views advocated.

What we have said presents one side of the subject from which probably there will be entered no dissent. We wish now to speak of another aspect of the question, and in doing so desire to take our subscribers, whom we regard as our friends, into our confidence, behind the scenes so to speak, believing that a little heart to heart talk will be productive of good.

In every business as conducted to-day, the cost of material within the past few years has sharply advanced. The manufacturer, in order to maintain himself has been obliged to increase the price of his products. So, too, with Telegraph Age, the greatly enhanced cost of production makes it necessary that we should receive a higher rate for subscriptions than that so long maintained. Accordingly it has been decided to raise the subscription price from $1.50 to $2.00 per year, the same to go into effect on September 1. All subscriptions, domestic or foreign, mailed to us prior to that date, and reaching us subsequent thereto, will of course, be entered at the present rates of charge. After that date the domestic rate, which includes papers going to all points in the United States, Mexico, Cuba, Porto Rico, and the Philippine Islands, will be $2; Canada, $2.50, and other foreign countries, $3.00. Even at these rates Telegraph Age remains one of the lowest priced of so-called trade papers published.

We have arrived at this conclusion reluctantly, but facts in any given situation are stubborn elements to be considered, whether faced in the career of a newspaper or in that of an individual. The cost of paper, of printing, and in numerous instances that of postage, (resulting practically

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in many hundreds of cases of furnishing the paper to the subscriber at but two cents a copy), without enumerating the added high cost of supplies of all kinds, have gone up—have been going up, and now Telegraph Age must as a measure of self-protection take cognizance of this change affecting every department and item of expense. The addition of fifty cents in the yearly subscription price will not mean much to the individual, yet in the aggregate to Telegraph Age the difference will amount to considerable and render the expense of publishing less severe.

It is hoped that our subscribers will cheerfully acquiesce in this change and sustain us in this obligatory move in the future, with the same loyalty of purpose as that evinced in the past. Telegraph Age will not only be maintained at its present state of excellence, but its conductors are ambitious for its future. Our readers will receive even a fuller equivalent for their money than ever before.

What the Telegraph is Up Against.

The woes of the telegraph are many. This time the difficulty appears to be with a gentleman out in Arkansas who has got his fighting blood up and who is fiercely demanding satisfaction of the telegraph to the extent of $1,000—not a cent less. It all came about because of the failure of a messenger boy to deliver a message to the now irate individual, the plaintiff in the suit, and then incidentally because the young mercury said things, thus injecting a pungency into the transaction that gave it abundent additional life and color. The messenger was instructed to deliver a message that bore an address that long since had become obsolete by reason of the removal of the addresse. Then the telegraph emissary redoubling his efforts, pursued the object of his quest to other addresses furnished him at his last place of call, going up one street and down another in an altogether vain search. His endeavors to locate the elusive individual were like the pursuit of the will-o-the-wisp. At length, prompted doubtless by weariness and disgust born of futile attempt, the boy finally blurted out in sheer desperation that he "would be d——— if he went any further to chase any man," and accordingly took the message back to the office. Perhaps it is the human attribute that we recognize as finding expression in the final words and action of this Western messenger boy so like his Eastern prototype, that causes a smile to play across one's features. It is doubtful whether any court will rule against the boy and so incriminate the telegraph company, even though the plaintiff lost a job, as he alleges he did because the telegram did not reach him.

Mental anguish to the value of five thousand dollars figures in an Ohio suit against the telegraph, due to the difference between the words "drink" and "die." There is no doubt that these two words are invested with a separate and distinctive meaning, although it must be admitted that their close correlation sometimes stands out in the expression "Drink to die," or its reverse, "Die to drink." In this particular case it is claimed that a telegram was sent from a neighboring state to a gentleman to inform him that his son was engaged in the reprehensible practice of drinking. The message is alleged to have been written: "He is drinking; what do you want done?" When the telegram was delivered its phraseology was declared to have undergone a transformation, inasmuch as it transmitted the information that the son was "dying," not "drinking."

Apparently the understanding conveyed in the word "drinking" was regarded as a negative quality, "dying" being positive. This difference in meaning between the two was estimated to be worth just $5,000, a basic sum, as determined, that should properly be charged up to that mysterious condition denominated "anguish," to which "shock" was supplemented; while a further amount of seventy-four dollars was added to cover the cost of traveling expenses claimed to have been expended in order to reach the supposedly dying son.

It may be that an intelligent jury, if the case ever reaches that decisive body, will consider that the "anguish" complained of constituted a necessary parental arousement, and that the seventy-four dollars expense incurred was money well spent in transporting the father to the moral rescue of the son.

A year ago, owing in part to the then prevailing high price of copper, the tax assessment of the telegraph companies was sharply advanced in many of the states. Now that the cost of that metal has dropped back again more nearly to its normal value, it would appear to be an act of justice were the states to take cognizance of that fact and govern their telegraph tax assessments accordingly. This view of the situation, however, does not seem to prevail, although the equities that should obtain are clear. While the market rate for copper formerly came under close scrutiny as an important factor in determining valuations for purposes of taxation, the price of that commodity as quoted to-day, is apparently void of consideraion.

The business of the telegraph companies begins to show an improvement over that of lately preceding months. This improvement has not been localized as to either section of the country or nature of industry, but has been very generally distributed. The increased number of messages arising from the better commercial conditions is quite marked and shows steady gains.

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Reward of Merit.

Harper's Weekly takes no stock in the frequently-advanced theory that railroad presidents as such are selected to the office they fill because of favoritism due to riches. As a matter of fact, it says, the railroad presidents of this country fill the places they hold because of ability gained through long service, usually beginning at the foot of the ladder. If they have become wealthy it is as a rule because they have fairly earned their wealth. Many of them began life as common laborers or at a grade, closely related thereto. The paper cites a few instances as follows:

President J. A. Edson, of the Kansas City Southern, was a telegraph operator on the Lake Shore. President Underwood of the Erie, was a freight brakeman. President Earling, of the Chicago, Milwaukee and St. Paul was a telegraph operator. President Harahan, of the Illinois Central, was a member of a construction gang, and became its foreman as his first rise in the world. Theodore Shonts, president of the Clover Leaf, who was president of the Panama Canal Commission, and whose daughter married a Duke, began his career as water boy of a construction train in Iowa. President Garrett, of the Seaboard Air Line, was a messenger boy in the St. Louis Union Station. W. C. Brown, senior vice-president of the New York Central, was a telegraph operator. President Murray, of the Baltimore and Ohio, was a ticket seller in Texas. President Stevens, of the Chesapeake and Ohio, was an office boy and telegraph operator with the Baltimore and Ohio. President Newman, of the New York Central, was a freight clerk on the Texas Pacific. President Tuttle, of the Boston and Maine, was a ticket clerk. President Samuel M. Fenton, of the Alton, was a rodman in Pennsylvania, and President Smith, of the Louisville and Nashville, was a telegraph operator.

Hundreds of other instances might be given, not alone in the railroad world, but in other industrial fields, but enough has been cited to show something of the glorious opportunities that this country holds for men—real men! This opportunity, open to the poorest laboring man, is one of the greatest glories of American institutions. It shows that the declaration that high place is the reward of favor or dishonest dealing is a pessimistic, snarling lie. It proves beyond a doubt that honest merit wins in the long run, and that in this country, above all others, every man has his chance!

The International Electrical Congress.

The International Congress of the Applications of Electricity will be held at Marseilles, France, September 14 to 20. The Marseilles electrical exposition, which is now being held in the Prado Park, and will continue until October 31, is one of the largest exhibitions of electrical machinery and apparatus ever collected on the European Continent, according to the Western Electrician, and the International Electrical Congress has taken advantage of this occasion for its meeting.

The sessions of the congress, which has for its purpose the examination of technical and commercial problems, will consist of reports and discussions by leading authorities on the questions up for debate. Many courtesies will be extended to attending members of the congress. French railroads and steamship lines promise substantial reductions in fares, and the freedom of the electrical exposition is granted to members during the convention.

Applications for membership in the congress may be made, accompanied by the equivalent of 20 francs (about $4), by addressing the treasurer of the International Electrical Congress, 63 Boulevard Haussmann, Paris. Members will receive a complete report of the convention.

The programme of the sessions of the congress is divided into sections, which will treat such special subjects as the legal aspects of electrical operations, the construction and operation of electric lines, commercial and technical exploitation, applications of electricity to industrial, mining, traction, agricultural and domestic purposes, electrochemistry and metallurgy, telephony and telegraphy, standards and measures, and electrotherapeutics.

Among the well-known engineers who will present papers are the following, with their subjects: "Telephonic Communication Over Lines on Power Transmission Poles," G. Laporte; "Electrical Installation on Shipboard," Gaston Roux; "Electrical Illumination," A. Blondel; "Comparison of Traction Systems," Eduard Tissot; "Electrotechnical Schools," Paul Janet.

Important Patent Decision.

The United States Supreme Court has rendered a decision in a patent case, according to which the owner of a patent does not forfeit any rights under the same by withholding its use from the public. The case was that of the Eastern Paper Bag Company, which had sued for infringement of a patent of which it had not made use and had denied use to others. Among the arguments offered by the defense were that for an owner to neglect to use a patented invention and yet restrain others from using it was to violate the intent of the patent monopoly, the purpose of which is to promote the progress of the useful arts. The court, relying upon precedents, rejected this view, and held that the granting of a patent monopoly implies that the owner has an absolute property right in a patent.

According to this decision if an owner does not wish, for any reason, to work a patent, he need not do so, and can restrain all others from doing so during the life of the patent. In a dissenting opinion, Justice Harlan held that the prevailing opinion of the court was in conflict with public policy.—Electrical World.

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The Filing Time on Messages.

EDITOR TELEGRAPH AGE:

The contention that the sender of a telegram is the person most interested in having the time when it is handed in for transmission included in or marked on the delivered message, seems rather strange. There may be times when, for special reasons, the sender wishes the receiver to know when a message was sent, but these times are exceptional and infrequent. In such cases the sender does not object to paying for the necessary additional words which are included in the body of the message.

It seems rather a preposterous assumption that the sender should usually have any special reason for transmitting the time when he hands in a telegram, because he knows the time himself and if he should desire to record it on the message blank, in the form of a memorandum not to be included in the message but only for possible reference at some future time, he can do so.

The sender does not care to have the time of sending transmitted, but he does desire prompt service. This cannot be enforced by having the time transmitted. His own evidence concerning that is sufficient to establish the fact and it would not be strengthened by having it in the form of a message. His interest is not so much in the time of sending as in the time of delivery, so it is not clear why he should be made to pay for extra words which he cares nothing about.

Receivers of telegrams frequently wish to know when they were sent. There are many reasons why this should be so. Sometimes it is important to know whether a particular message was sent before or after a certain hour. If there has been delay in transmission, there is no indication of it on the message delivered, and the fact ought to be made known.

The disposition seems to be to ignore or to becloud the real reason for the demand that has been made upon the companies that they shall mark the time when messages are received for transmission. If telegrams were handled more promptly there would be no reason for such a demand. It springs from the fact that one can sometimes travel by rail and arrive at his destination in advance of a telegram, and there is a widespread belief, founded on the experience of many persons, that telegraph business is not conducted with proper speed. Therefore the companies are being called to account in a manner they do not like; but it would seem to be the only way to effect the desired improvement. The writer once telegraphed in the evening from Wayne Junction, Pa., to New York City, saying that he was waiting for a train that was late. After waiting for the train and taking the trolley car in New York to his home, he arrived a few minutes after the telegram. He telegraphed about 9 A. M. from New York to an important town about forty miles distant, saying he would be there in time for dinner. Arriving about half-past twelve he was fifteen minutes later than the telegram. A special delivery letter was mailed in New York for Philadelphia one day, and about the same time a telegram was sent to the same address. The special delivery letter won the race.

It is absurd for the companies to attempt to charge for the additional words giving the time. The movement is intended for their own good. It's real object is to encourage the companies to do business more promptly and they should not make any charge for such healthful stimulation.

ROMYN HITCHCOCK.

New York, August 8.

A Simple Duplex Telegraph System.

A simple duplex telegraph system is described by the Electrical Review in an article abstracted from a French electrical journal, in which, in addition to its simplicity, is independent of the weather conditions, there being no necessity to balance up an artificial line against the varying resistance of the transmitting line. The system requires at the sending station, two ordinary Morse keys connected in independent circuits between the line and the ground, each circuit including a battery. A third circuit connected in parallel with the two ground connections of the keys contains a resistance and a third battery more powerful than either of the other two. At the receiving station there are two receiving instruments, one of which is a simple sounder operated by a polarized relay responding to positive current impulses. The second is a similar sounder, connected, however, in the opposite direction, so that it responds only when its local circuit is broken. This may be accomplished by either of two relays, both of which are polarized. One responds to weak negative current impulses, and the other to strong positive impulses. In operation when either key of the sending station is closed it sends a relatively weak positive or negative impulse over the line, according to which key is depressed, and this impulse causes the corresponding relay at the receiving station to respond. Should both keys be depressed at the same instant this will send a strong positive impulse over the line, actuating, of course, the relay which responds also to weak positive impulses and that one in the receiving station would respond. To secure operating conditions it is necessary to have the battery which comes in operation when both keys are depressed sufficiently powerful to operate both relays. When one key alone is depressed this battery does not send an impulse over the line, because at that moment it is shortcircuited through a resistance and the other key, the potential thus thrown upon the line being insufficient to overcome the opposed working battery.

H. E. Wilson, manager of the Postal office at 184 Franklin street, New York, in renewing his subscription writes: "I wish you continued success with the Age, which is always interesting and instructive."

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Telegraph Engineers in France.

The engineers for the French telegraph service are drawn from two sources. Major W. A. J. O'Meara, C. M. G., the head of the English telegraphs, in an interesting article in the Post Office Electrical Engineers' Journal, refers to these; first, officials of the postal and telegraph branches of the post office service; and, second, candidates having certain qualifications who are not connected with the postal administration. He further says:

Officers obtained from both sources have to undergo a course of instruction of two years' duration at the École Professionelle Supérieure des Postes et des Télégraphes, Paris. Officers of the postal administration desiring to become engineers have to compete at an examination for admission into the École Professionelle; they are nominated as candidates if they hold a good service record and are well reported upon by their superior officers. They must possess at least two years' effective service, and must be under thirty years of age on January 1 of the year in which the examination takes place; the entrance examinations are held once in every two years. The candidates have to undergo written and oral examinations in the following subjects: Written portion—Mathematics, four hours; mechanics, four hours; physics and chemistry, four hours; drawing, three hours; oral portion—mathematics, mechanics, physics, chemistry, and modern language (English or German); second modern language (other than English or German).

No candidate is allowed to take part in the oral portion of the examination unless he has first satisfied the examiners in the written portion of the examination. Bad spelling also disqualifies a candidate. The positions of the candidates on the competitive list are determined by the total number of marks obtained in the two portions of the examinations. The subjects mentioned, except the modern languages, are all compulsory. The whole of the marks obtained in each subject are counted for placing, with the exception that in the case of the modern languages marks equal to sixty per cent. allotted to these subjects are first deducted from those obtained, and the balances only are credited to the candidate.

Candidates for engineerships, who are not already serving in the postal administration, must have satisfied the requirements of the French law regarding military service, and must be less than twenty-six years of age on January 1 of the year in which they join the École Professionelle. Their applications for admission to the school are addressed to the Under-Secretary of State for Posts and Telegraphs, and must be accompanied by, first, birth certificate, and, if necessary, letters of naturalization; second, certificate of good moral character; third, extract from sheet relating to offences tried in civil courts of law; fourth, certificate of good health from medical officer of the administration. This certificate must also state that the candidate has been revaccinated within less than six years from date of application, and fifth, document proving that the candidate has fulfilled his military obligations.

The candidates not already serving in the postal administration, who are admitted to the École Professionelle, are drawn from the students of the École Polythenique who have completed the two years' course at the latter institution; they are not required to pass the examination for admission to the École Professionelle already referred to, which only applies to officers serving in the postal administration.

It may be of interest to learn that although the École Polythenique is essentially a military school, and a strict military discipline is maintained there, yet nearly all the civil engineers required for the service of the state are trained at this institution. Entrance to the École Polythenique is obtained by means of a competitive examination open to young men between seventeen and twenty-one years of age, and as this institution holds a high reputation owing to the large number of eminent and illustrious Frenchmen who have been trained there, a large number of candidates of high attainments are attracted. Candidates for admission must possess a university-leaving certificate, and success at the entrance examination proves that the candidate has already obtained a wide range of scientific knowledge. At this examination mathematical subjects occupy a very important place, and considerable proficiency is also required in physics, chemistry and drawing. The aim of the school is to provide a very advanced scientific education. The subjects studied are differential and integral calculus, geometry, mechanics, thermo-dynamics, electricity, optics, acoustics and chemistry. The students after leaving the École Polythenique receive specialized teaching in a number of schools of practical engineering, such as the School of Mines, the School of Roads and Bridges, etc.

All the candidates admitted to the École Professionelle Supérieure des Postes et des Télégraphes are appointed "engineer-students," and receive a salary of £72 per annum, and the allowances provided for by regulations. The officers of the department who are admitted to the school retain the salary of the rank they hold, and they also retain, while at the École Professionelle, any rights regarding promotion which they may possess in their class. These officers are also granted an allowance to cover their transfer to Paris, the maximum of which is fixed at £16.

The "engineer-students" have to undergo the instruction laid down for the "Second Section" of the École Professionelle. The course consists of: (a) the theoretical and practical courses in the École Supérieure d'Électricité; comprising, general electro-technics; lectures on the application of electricity for traction purposes, etc.; continuous and alternating current generators; construction of electrical machinery; distributing systems, aerial and subterannean; accumulators;

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electro-chemistry; practical laboratory work, including testing of machines; workshop practice; visits to electric works; preparation of scheme of electric lighting and power transmission; design of plant; calculations in connection with the design of continuous and alternating current generators.

(b) The courses and lectures special to the "Second Section;" comprising, application of statutory provision incorporated in the laws affecting the post office services; theory of electricity, and its applications to telegraphy and telephony; propagation of electric current in conductors, during its variable period, in relation to telegraphy and telephony; steam, heat and hydraulic machines; automobiles and railways; submarine cables; pneumatic tubes; construction of aerial and subterannean lines; course of architecture; strength of materials; postal materials; laws relating to workmen; machine designs.

(c) The courses common to the two sections of the school; comprising, general principles of telegraphy and telephony; construction of aerial and underground lines; statutory powers; general principles relating to administration and accounting.

(d) Practical studies and visits to places in France and abroad for purposes of instruction; comprising, manipulation on telegraph circuits; testing; English and German conversation and translation; visits to large telegraph and telephone offices; graphic representations; visits to district headquarters in France for study of industrial undertakings; visits to foreign countries for study of a postal, telegraphic or telephonic installation, and of an industrial undertaking; working out of a complete scheme of installation; laboratory exercises.

During the first year the application of electricity to industrial purposes is studied at the École Supérieure d'Électricité. During the second year the students attend the professional courses of instruction at the École Supérieure des Postes et des Télégraphes. Some of the subjects require a considerable knowledge of the higher branches of mathematics, and the necessary instruction is provided for those students who are able to derive profit from the same. A great part of the course in the second year is thoroughly practical in character: the students work out practical problems, signal messages, carry out electrical tests of apparatus and lines, visit important telegraph and telephone offices, go through a laboratory course and prepare projects for telegraph and telephone installations, etc.

The students have to furnish reports in connection with each of their visits relating to the courses of instruction and their papers carry marks which are added to those obtained at the examinations, the grand totals thus obtained determining the final classification of the students on completion of the course at the École Professionelle.

At the end of the first year an examination is held. It consists partly of written replies to papers, partly of answers to oral questions, and partly of practical tests. The marks obtained at this examination are carried forward to determine the final classification of the students.

At the end of the second year the students have to furnish a scheme relating to a telegraphic or telephonic installation, and also a paper on laboratory work (standardization, special study of a particular apparatus, etc.). The marks obtained again count for the final classification. In addition, a second series of examinations on the subjects on which instruction has been given, are held. These are also partly in the nature of written replies to papers, partly oral, and partly practical.

For a pass, students must obtain sixty-five per cent. of marks. Students drawn from the postal administration failing to satisfy the examiners are relegated to the positions they held when nominated for admission to the school, while those who were not formerly in the service of the postal administration are appointed to clerkships, and retain the scale of pay they may be receiving at the school. Students who fail at an examination may be allowed to present themselves for re-examination once only. The successful students are appointed second class engineers.

It is quite clear from this account that not only do the French telegraph engineers enjoy the advantage of receiving a thoroughly practical and wide training to fit them for their responsibilities, but that care is also taken that only those shall participate in the course of instruction in the École Professionelle who have shown that they possess the energy to study and are likely to derive profit from the course of studies laid down for the "engineer-students."

It is further recognized that it is not possible for every young man in the post office service to acquire, without assistance, the necessary knowledge to take advantage of the education provided at the École Professionelle, and in consequence, facilities are granted to officials desirous of competing for admission to the "Second Section" of the École Professionelle, for study at one of the higher state schools at Paris, and, in some cases, at the university.

Love Your Work.

Only the fool speaks disparagingly of the work which his hands find to do, truthfully says the Wall Street Journal. And he is a genuine fool, because to speak or even to think so is to put obstacles in his own pathway. For our attitude towards our work is a decisive factor in its accomplishment. Therefore, to use the current parlance, be in love with your job. Take pride in it. Speak well of it, and it will speak well of you.

The articles under the standing head of "Some Points on Electricity," published regularly in TELEGRAPH AGE, are filled with practical information for the up-to-date operator. Send for a sample copy.

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A British View of the Western Union Telegraph Company.

The Stock Exchange Gazette, of London, a financial journal devoted to the interests of investors, in a recent issue had this to say regarding the Western Union Telegraph Company: "This huge undertaking has paid dividends at the rate of 5 per cent. per annum on its capital stock without intermission since 1888, and has accumulated in the meantime a credit balance on profit and loss account of $16,884,800. It has survived the financial storms which have played havoc with other industrial enterprises in the United States, and has dealt successfully with labor troubles which would have engulfed a less ably managed undertaking. Nor is this all, for the average toll per message has been raised during recent years from 30.9 cents to 33.7 cents, and though the latter figure is still far below the highest on record, namely, 50.9 cents in 1865-6, the upward tendency which has become noticeable since 1898 is a decidedly encouraging development. At June 30 last the company possessed 205,600 miles of poles and cables and 1,321,200 miles of wire; there were 24,760 offices, and 74,804,500 messages were dealt with during 1906-7, exclusive of those sent over leased wires or under railroad contracts. Receipts have advanced almost without intermission, and the total of $32,856,400 for the year ended June 30, 1907, constituted a record in the history of the undertaking. This remark also applies to working expenses, a ten per cent. advance in salaries having come into force on March 1, 1907, and for this reason the net revenue balance for 1906-7 of $6,324,200 was $746,400 less than for the twelve months preceding. Nevertheless, there remained a surplus of $36,000 to add to the sum brought forward, after meeting bond interest amounting to $1,420,000 and $4,868,000 representing the five per cent. dividend for the year. It is, therefore, unnecessary to emphasize the soundness of the company's financial position; nevertheless, it may be mentioned that stocks and bonds in other companies are held to the value of over $23,000,000, and in addition the balance-sheet shows real estate $5,088,000. There is a bonded debt of $38,615,000, made up as follows:—Funding and real estate 4½ per cent. mortgage bonds, $20,000,000, due May 1, 1950; 5 per cent. collateral trust bonds, $8,615,000, due January 1, 1938; while there is also $10,000,000 of 4 per cent. gold bonds, redeemable at 105 on May 1, 1912, or any subsequent date of interest payment. They may also be converted, on terms to be fixed, but not less than par, into stock, and at the current quotation of about 80 this issue is undoubtedly a bargain, the yield being 5 per cent., while in the event of conversion or redemption holders will receive a bonus of anything over 20 per cent.

Symbols for Physical Quantities.

It is very desirable to have a notation for the representation of physical quantities in scientific books and periodicals which shall be the same in all languages, says Miles Walker in the Electrical Review.

The subject is under the consideration of the International Electrotechnical Commission with a view to international agreement, and committees in the different countries (in England under the chairmanship of Lord Rayleigh) are discussing this particular subject. They are dealing more especially with symbols for electrical and magnetic quantities, but the system might with advantage be extended to embrace all important quantities in physical science, especially as the subject is receiving the attention of most technical societies with a view to some action being taken in the matter.

There are, however, two great difficulties which arise when we try to fix upon a standard notation.

The first is the difficulty of persuading a number of writers and readers who have become accustomed to a certain symbol for a certain quantity to change it in favor of an equally large number of writers and readers who have become accustomed to another symbol.

In the second place, there are not enough letters in the two or three alphabets at our disposal to give a distinct symbol to each quantity without resorting to the combination of more than one letter to form a single symbol. There is a great objection to this combination of letters because the use of sub-script letters and numbers is required for distinguishing between particular quantities of the same general kind.

There is, moreover, an objection to using letters at all to represent quantities in a universal notation because, unless initial letters are used, there is no connection in the mind between the letter and the quantity, and the symbol is difficult to remember. We can not always use initials because the initial letters differ in different languages. Moreover, the same initial occurs for a great number of different quantities.

One way of avoiding these difficulties would be to create a number of new symbols which could be printed by means of type like ordinary letters, and which would represent each physical quantity in a distinctive manner.

The question, however, arises as to whether a number of entirely new symbols would be acceptable to writers, readers and printers alike, and the sub-committee on symbols appointed by the British section of the commission has requested the writer to place his views publicly before the profession with a view of obtaining suggestions and criticisms as to the feasibility of such a scheme from as wide a circle as possible.

William J. Dealy, superintendent of the Commercial News Department of the Western Union Telegraph Company, New York, speaks of Telegraph Age in this characteristically genial way: "I know of no telegrapher, active or ex, who does not on arrival of The Age, immediately greet it as he would his best friend."

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Bound Volumes of Telegraph Age Covering a Memorable Year in the Telegraph.

The year 1902 was especially significant in the annals of the telegraph, inasmuch as that date marked the accession to office of the present official heads of the Western Union Telegraph Company. The story as told in Telegraph Age distributed over the months of that year, chronicling the numerous changes that eventful period witnessed, is of interest, one viewed with importance by many as being of high referential value, furnishing data and dates nowhere else so readily available. A portrait of Colonel Robert C. Clowry, the incoming president and general manager of the company, and of General Thomas T. Eckert, whom he succeeded, as well as others prominent in the Western Union service, were included in the issues of the paper during that year.

In that year, also, occurred the death of John W. Mackay, the head of the Postal telegraph and Commercial Cable companies. His passing necessarily wrought changes in the great telegraph interests under his control, their direction descending as a possession to his son, Clarence H. Mackay, their present head. Full-page engravings of both the Messrs. Mackay also appeared.

It was in 1902, also, that Telegraph Age printed a comprehensive, instructive and illustrated article descriptive of the famous Buckingham Long Distance Page-Printing Telegraph, a chapter covering nine pages and of profound interest. Again, it was in this same year that the notable telegraph tournament, known as the American Telegraphers' Tournament, was held at Atlanta, Ga., when some well remembered records for fast sending were established, an event altogether of achievement of which telegraphers are proud and delight to refer.

Enough has been indicated to show that the year 1902 was an eventful one in the telegraph. The bound volumes of Telegraph Age for that year possess a special value. A few are on hand and are offered for sale at $2.50 apiece. These will be delivered to any address in this country, carrying charges prepaid, on receipt of price. Address all orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

It is the Unexpected That Always Happens.

The visitation of a big black bear weighing in the neighborhood of three hundred pounds, making sudden and unbidden entrance through a window with a propelling force that would have done credit to a wandering meteor, was reserved for the experience of a telegraph operator of the Norfolk and Western Railroad at Juniper, Va., the other day. Mr. Bear and a rapidly passing engine of a train came in violent collision with the result that bruin was hurled into midair and sent flying into the telegraph office. The introduction thus effected did not lack dramatic features, of which it afforded a concrete example. It was accomplished, too, with unerring directness, for the big beast struck the operator, who was sitting quietly at his key, with a loud concussion, and both fell to the floor stunned for the moment as a result of the terrific contact. It was a moment of astonishment; of that there was no doubt. Recovering their senses at about the same time the bear showed an immediate disposition to resent the indignity inflicted upon him. In fact, he was thoroughly mad. He was in no humor to make friends even with an inoffending telegraph operator, and as human sense was less aggressive in its methods, preferably choosing diplomatic procedure, so frequently resorted to in obtaining delay, especially when a safe distance from an enemy is to be encouraged, rather than risk an encounter as in this instance, with brute force at close range—besides following the wise dictum that discretion is the better part of valor, the operator managed to scramble out of reach, finding refuge and safety in the loft of the station in which the telegraph office was situated. Here he was forced to remain until a train crew sent to investigate the absence of telegraph signals from Juniper discovered the cause. Then, of course, the bear was forced to succumb to the cunning of superior human force and to yield up his life because he had followed but brute instincts.

Soldier Telegraphers in India.

Among factors in the success of an Indian frontier expedition, such as that recently undertaken against the unruly Mohmands, the Indian Government telegraph department is by no means the least important. Bearing in mind the frequency of these little wars, it is, perhaps, small wonder that this service should have become thoroughly efficient, as it undoubtedly is. All calls made upon its resources by the military authorities invariably meet with a prompt response, and its organization is probably as perfect as it can possibly become.

In these expeditions soldier telegraphers are called into requisition, men who are not, like the English engineers, embodied in one regiment or corps, but are drawn from various branches of the Army—artillery, cavalry, and infantry. A certain number of young soldiers of good education, who are at the same time first-class shots, are trained as telegraphers. After passing an examination they are held exempt from all regimental duties, and are employed in the main telegraph stations throughout India, working about eight hours a day. This employment is supposed to be only of a temporary character, but, as a matter of fact, most of these men remain regularly employed for years. They are thus, when chosen for active service, thoroughly competent to carry out the duties allotted to them.

Orders for books on telegraphy, wireless telegraphy, telephony, all electrical subjects, and for cable codes, will be filled by TELEGRAPH AGE on the day of receipt.

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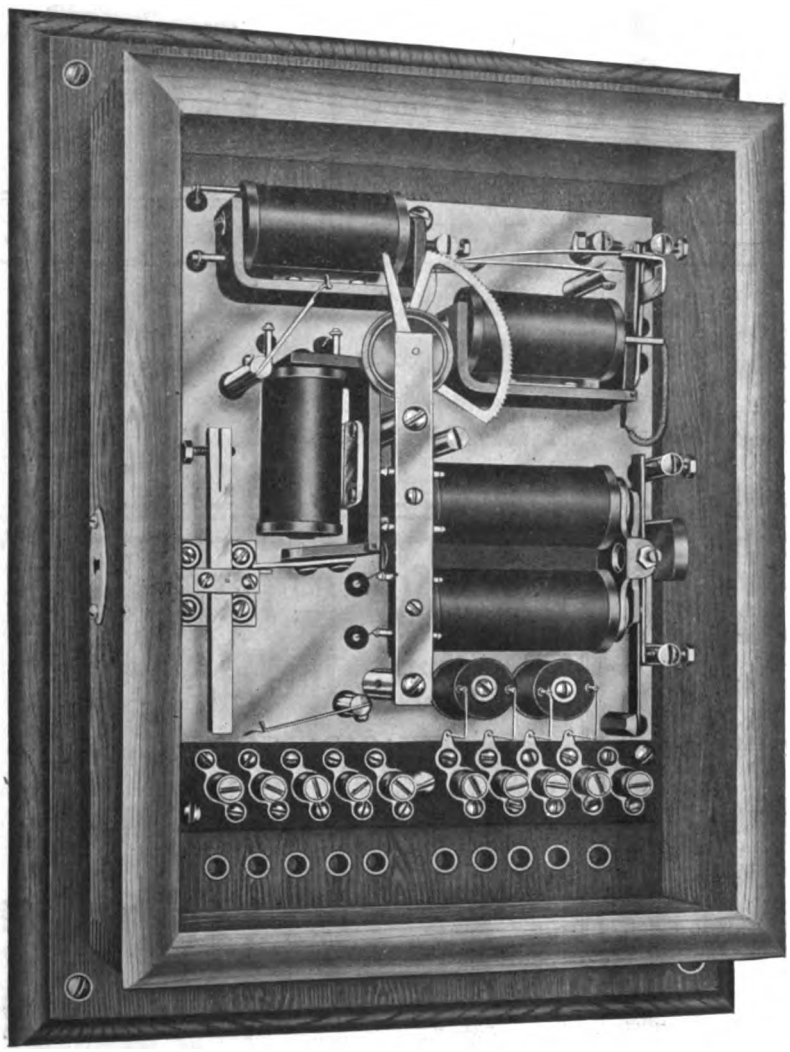

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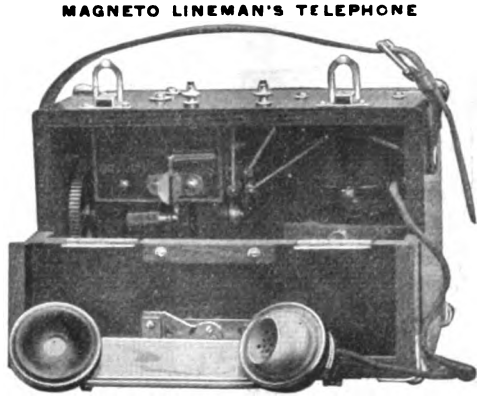

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The Railroad.

Mr. F. A. Parker has been appointed chief despatcher and division operator of the Missouri division of the Chicago, Rock Island and Pacific Railroad, with headquarters at Trenton, Mo., succeeding J. P. Quigley, resigned.

The substitution of the telephone for the telegraph in train despatching service is reported to be under consideration by the New York, New Haven and Hartford Railroad. The nine-hour law for telegraph operators, which has increased the payroll account and the payment of heavy toll charges for leased telegraph wires, are primarily responsible for the present consideration of the problem.

The telegraph plant of the extension of the Chicago, Milwaukee and St. Paul Railroad, now under construction from the twin cities to the Pacific Coast, will provide a system consisting of four through wires—two copper and two galvanized iron. In addition to connections for telegraphing, there will be a complete telephone service. The work is being expedited at different points. U. J. Fry, of Milwaukee, is the superintendent of telegraph of this road.

After a three week's trial the Delaware, Lackawanna and Western Railroad Company has decided that the system of despatching trains by telephone instead of by telegraph, has proved entirely satisfactory. At the present the telephones are operated by the telegraphers, but it is probable that, after the system is in thorough working order, there will be a considerable reduction in the number of operators. All trains passing between Scranton and Binghamton have been despatched by the telephone system, and not a single defect or mishap has resulted.

Interpretation of the Nine-Hour Law.

The suit referred to in our issue of August 1, brought jointly by the Pennsylvania and Lehigh Valley railroad companies in Pennsylvania, asked for an injunction to restrain the Interstate Commerce Commission from taking any further proceedings in pursuance of its order of March 3 to enforce the hours-of-labor law, alleges in its petition that the order of the Interstate Commerce Commission requires the railroads each month to make a detailed report of all instances where trainmen had been on duty for longer periods than the time prescribed by the act of Congress. The bill denies the power of the Commission to make such an order and alleges that the purpose of it is to get evidence to lay before the United States District Attorney in criminal suits, thus to compel the railroads to furnish evidence against themselves for breaking the law.

The Erie has entered a similar suit in New Jersey. The Baltimore and Ohio Railroad company has allowed itself to be enjoined in Maryland for violating the nine-hour law, and the case will speedily come to trial.

Chairman Knapp, of the Interstate Commerce Commission, and Commissioner of Labor Neill, constituting the mediation board under the Erdmann act, were in Chicago recently to confer with officers of a number of western railroads and the Order of Railroad Telegraphers with a view to effecting an adjustment of the controversy growing out of the interpretation of the nine-hour labor law. The act provides that a telegraph operator shall not be required to work more than nine consecutive hours out of twenty-four, except under stress of business conditions. Commissioner Neill does not believe that the differences offer any serious obstacle to a satisfactory settlement.

Officials of the Order of Railroad Telegraphers claim that the day is so divided that sixteen hours are worked continuously without violating the law. They say that this is true in the case of night operators. Many of the roads limit the day periods to nine hours, but work the night operators double the limit set by the law. It is charged that the superintendent of telegraph of one of the roads has divided the "tricks" so that the operators work three hour "splits" during twelve continuous hours. It is said that two operators are all that are required to do the work in one office supposed to be open twenty-four hours a day.

It is understood that the conference is to determine what interpretation shall be put on the law. The act provides that operators shall not be required to work more than nine consecutive hours. The modification of this rule is contained in a stipulation reading "unless unavoidable through business pressure and then only so long as no relief can be obtained."

Opportunities Afforded in the Railroad Service.

BY E. A. CHENERY.

Superintendent of Telegraph of the Missouri Pacific Railway.

[No one is better qualified than Mr. Chenery to write on the subject respecting the opportunities afforded young men in the railroad service to achieve business success. What follows was in reality a component part of a paper he read before the Association of Railway Telegraph Superintendents at Montreal, June 24, 26, but as it really furnishes a chapter by itself on an interesting question to which the remainder of his subject was but remotely connected, the matter is presented in separate form at this time.—EDITOR.]

It is generally admitted that of the present officials of our railroads, fully eighty per cent. started their career by way of the telegraph route; at the same time it is equally well known that no other avenue offers such an educational and sure journey to success, particularly in the operating, accounting or traffic departments, if proper energy on a sound foundation is applied.

No branch of the service is so full of promise to the young man fresh from school and with a desire to make for himself a name in the army of railroad workers, as is that of the telegraph department as a starter. This clearly is apparent to those who consider their opportunities rather than their comfortable convenience; who know that honest and unceasing endeavor must succeed and that slipshod methods and lack of interest cannot but fail.

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The young telegrapher accepting his first position is in the Kindergarten class and cannot progress through the several grades to official position without constant nd earnest application. He usually makes his entry into the service at some way station—on a branch road more than likely—where his duties consist principally in recording and reporting the passage of the few trains that pass his station during the hours he is employed. The actual labor involved is so small as to almost warrant the charge of extravagance for his meagre services, and were it not that his presence may be desired in a possible emergency, such as an accident or a disaster, there would be little reason for his position.

But the young man is engaged and we will admit is employed through no particular desire on the part of the management to be philanthropic. Let us see what his opportunities are: The actual work assigned leaves so much idle time on his hands as to permit him with profit to utilize many hours in perfecting himself either as a more proficient telegrapher or in familiarizing himself with the duties belonging to the agent or other employes at his station.

The art of telegraphy is not mastered in time measured by days, weeks or even months, and there are few telegraphers of to-day who will claim they earned the right to wear the title in less than from four to five years. This is partly due to the fact that in some cases after serving as an apprentice for from six to nine months and then securing a position, the temporary goal seemed to have been reached and continued effort is slackened on the theory, I take it, that there is no further necessity of running after the street car is caught. If advancement is desired and expected it surely must be deserved and the result can only be obtained after a supreme effort to perfect oneself is made.

Every telegrapher at such an initial station, has opportunities to practice many hours daily and to become acquainted with the various duties required of telegraphers more advanced and of the station and train work generally. He has access through passing telegrams to the best thoughts of his superiors and may be in close touch in advance of the press with the news and gossip of neighboring towns and cities and should be the best posted man in the village.

Ambition when accompanied by applied effort and recognized ability though suppressed, will not be permitted to tarry long in such a place, as the despatcher, the agent or some other representative will have observed the traits and qualities of merit manifested, and a summons in the way of an offer for a better position is forthcoming. The new position carries with it, more work, greater responsibility and opportunities for acquiring knowledge of the ticket, freight, accounting, commercial and railroad telegraph, express and other details and to become more closely identified as a part of the great machinery going to make up the large industry of a railroad.

As this knowledge becomes broader, a larger field is opened. An agency is offered, is accepted and the young man then becomes the road's one and direct representative and is usually regarded as the one person to whom inquiries of all sorts may be directed, with a reasonable certainty that a correct and intelligent reply will be received. Continued application and association through personal contact and correspondence with general officers and the patrons of the company has by this time added much to his education and self-reliance, and if his energy and temperament are cultivated further in the right path, success is now in sight.

Whether he be fitted to advance to the position of train despatcher, as an expert telegrapher in one of the more important offices, or to a more representative position among the people, in the traffic department, or from his association and acquaintance with the commercial world, he chooses to engage in other pursuits, the opportunity sooner or later is bound to present itself.

Of the eighty per cent. of railroad officials who began as telegraphers, by far the greater number are of the operating department. Train despatchers are advanced to chiefs, then to train masters and in succession to superintendents, general superintendents, general managers and presidents. In the front ranks of the traffic and accounting departments are many who started in the kindergarten class of telegraphy and worked their way through the position of agent, cashier, ticket clerk, etc., to traveling auditors, freight or ticket agents,to more responsible positions at the head of such departments.

Despatching Trains by Telephone.

[The following communication which appeared in the Railroad Age Gazette, signed by Wayne H. Graeff, of Harrisburg, Pa., is an interesting contribution by a practical railroad man who discusses phases of the prevailing question of train despatching by telephone from points of view at variance with those becoming so generally accepted.]

"I have read with interest the article, 'Despatching Trains by Telephone,' in the Railroad Age Gazette of June 26, particularly the paragraphs relating to the employment of young men who frequent railroad stations and the promotion of conductors to despatching.

"I am ready at any time my superiors see fit to do my despatching by telephone, and shall do it as conscientiously as by telegraph and have no fear that it cannot be done as satisfactorily. However, there are several questions arising in this connection that should have further consideration before embarking in telephone despatching. It should be noted that the Burlington used the best equipment to be had in installing its telephone system. Given a telegraph line with the same high-class equipment, would the telephone system then compare favorably with the telegraph? The telegraph lines are a fixture and it is notorious that nothing short of a sticky snow or

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a cyclone will give us up-to-date equipment. Fortunately, the road I work for has an up-to-date telegraph system, but with railroads in general this is an exception.

"If I am correct, the operator on a telephone system hears nothing that occurs on the line until he is called to it by a bell. We pay operators to be 'on the job' and find that a good operator is 'on the job,' and not only listens for his call, but hears all that occurs on the telegraph line, no matter what part of the office he is in. When your operator hears nothing that is going on on the line he is liable to become an automaton. Again, the bell may be heard half a block away. Perhaps your operator will find it convenient to answer his calls from a pool room or the corner grocery. Suppose he claims the bell did not ring, has the despatcher the evidence from the rest of the operators on the line that he did call, as he has on a telegraph line? I have no doubt that it is easier for a despatcher to ring a bell than to call an operator in Morse, but I doubt if it is conducive of better results for his employers. A good despatcher considers his convenience as a secondary consideration when serving his employers' best interests.

"Again, is it possible with the system in use on the Burlington to have four or five operators receive an order simultaneously and check on each other's repeat without impairing the efficiency of the receiving instruments? I can picture a condition where a few trains waiting for orders are held up for their meets while a conductor gets to the telephone and holds a conversation with the train despatcher. Every despatcher has frequent encounters with crews who cannot see beyond the confines of their own train and who insist on having their way. Co-operation with the operators and crews is necessary, but let us not confound co-operation with familiarity. 'Familiarity breeds contempt,' and a man has ten times to think before he telegraphs a cuss-word, and can say it ten times on a telephone (before thinking) in the same space of time.

"I can readily see that the Burlington despatchers consider the new system a snap, as is stated. The equipment is all new, and as it has been in operation six months I presume they are still doing business with telegraph operators trained for the business. This brings us to the matter of securing telephone operators.

"The man who becomes a telegrapher has enough stability in his make-up to stick to it until he has learned the business, and while he is learning telegraphy he is also acquiring a railroad knowledge, without crowding that part of his education. I have lived in several country towns myself, and it is invariably the young man with no inclination for work of any kind that hangs around the railroad station. He has not the grit to learn a profession, and frequently does not finish his common-school education. Is this the young man to place in a responsible position to handle train orders? The establishment of railroad telegraph schools has augmented the supply of telegraph operators, but it will be found that even they require two or three months' practice in a railroad office before they can qualify for a position. How many months' practice should a telephone operator have at this rate, and are there provisions for him to cut in on the circuit to get an idea of what he will be up against in real service?

"I can see no objection to promoting a conductor to train despatching—if he can fill the bill. The reflection on the despatcher of to-day should be met. The despatcher is no theorist at all. He handles a great many trains, of numerous classes and a variety of conditions affecting each of them. The conductor's view is confined to his own train and his ability to get that particular train over the lines. We will assume that the best conductor on the line has been put on a trick—despatching. As he is above the average he will expect too much of the average conductor, and will be working at cross-purposes. The train despatcher of to-day knows just what each and every crew he handles will do under different conditions, and in practice it will be found that he is promoted because he took an interest in train movements and despatching before his promotion. With the telegraph he has had opportunities to follow up all his despatchers' train movements and do some thinking for himself. This is hardly possible with a telephone line, as he would be neglecting other duties in order to cut in on the line.

"Personally, I was promoted from telegrapher to chief despatcher's chief clerk and then to train despatching, and am one of five despatchers who followed the same line of promotion and are in service to-day. This was a far-sighted arrangement on the part of the chief despatcher, and has proven the ideal education for a despatcher. As chief clerk, ample opportunity was afforded to view the work of other despatchers, to ride over the division and to work the train sheet, and I maintain that a greater part of this education could not be obtained under a telephone system.

"Admitting that the talent of telegraph operators is decadent, does not the same condition exist with trainmen? With our people conductors have been tried out on a despatcher's trick, and it is significant that all our despatchers in service to-day have risen from the ranks of telegraph operators. If a superintendent has ever been a train despatcher he will admit that his experience with train crews has proven that they rarely figure on more than one train—their own—while on duty; and I would ask which is the greater theorist, one who has heard the arrangements made and assisted in the movement of many trains day by day, or one whose experience is confined to the execution of orders necessary to get himself over the line? This question admits of a great deal of argument which I would leave to older and more experienced men, who, I am sure, will silently, if not in print, refute that 'theorist after all' idea."

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"An Old Telegram" Arouses Reminiscences.

Orrin S. Wood, the veteran telegrapher, now over ninety years of age, and who in his earlier years (1847) superintended the construction of the Montreal Telegraph Company, with which he remained identified for eighteen years, most of the time as general manager, a system now merged with that of the Great North Western Telegraph Company, writes to Telegraph Age from his summer home at Turner, N. Y., regarding the reference to "An Old Telegram" appearing in the issue of July 16. His letter reads:

"The old telegram was from a small telegraph company (Toronto, Hamilton, Niagara and St. Catharine's Electro-Magnetic Telegraph Company), which we bought the year after I went to Canada to open the old and successful Montreal Telegraph Company. We paid three per cent. semi-annually to the stockholders the first six months after opening the line, and kept it up until we increased the dividends to four per cent. semi-annually, a rate which, I think, no other telegraph company succeeded in doing until several years later. The old company was the first to establish a uniform rate over all of their lines of twenty-five cents for ten words, notwithstanding our first lines were all built on highways. We were obliged to do a great deal of night work with only one set of operators, as so many trees were constantly falling on our wires, mishaps caused by careless choppers."

Mr. Sidney B. Gifford, of Syracuse, N. Y., also writes:

"Noting in the July 16 issue of Telegraph Age the story of "An Old Telegram," I beg to send you herewith a few old timers to add to your collection of relics of the early days. These papers are in nearly the same condition as when, from time to time, they came into my possession. Some had evidently been carried in the pocket of the former owner. Among them are four telegrams, each on a different blank form, and all dated earlier than that mentioned in the article in the Age. Please note the Rochester form is a sheet of note paper and was sealed with a wafer. A careful reading of the printed statement of about January 1, 1850, will reveal much of interest as to the situation in telegraph circles at that time. Many of the other papers will also prove interesting reading."

Included among the enclosures referred to by Mr. Gifford, was a letter dated at Utica, N. Y., May 31, 1851, and addressed to J. D. Stone, of the "'Morse' Telegraph Office," Syracuse, N. Y. It bore the signature of T. S. Faxton, president of the New York, Albany and Buffalo Telegraph Company, and was written in a small, neat hand, indicative of care and freedom from haste, on the large, square front leaf of a four-page sheet, of a pale blue tint, on which the name of the company was printed across the top in small, plain type. This was a "circular" letter, so indicated by that word being written on the upper left-hand corner of the sheet, and was addressed with the conventional "Dear Sir." This communication was presumably sent in duplicate to all managers, at most few in number at that time, so that each received probably an original long-hand letter. All of which, both in form and method, presents a decided contrast from the procedure of to-day in sending out matter similar in character.

Mr. Faxton announced that as he contemplated being absent in Europe from June 1 of that year, for a period of three or four months, "the business of this company will be managed by Mr. Chapman, to whom you will make report of all business relating to accounts and money transactions, as fully as you would to me personally were I at home."

It was further stated that "Mr. Johnson, of the New York office, will have full charge of the operators' department, so far as the working of the line is concerned, and all operators will be subject to his directions in the performance of their duties as operators." The letter concluded with the injunction expressing the hope and expectation "that each and all of you will cordially and cheerfully comply with such regulation and system of working the line as shall most advance its success and the interest of the company, by a strict attention to its business, and most rigid economy in the disbursements necessary to carry on the business at your office, for on these everything depends for the future success of the line; and on my return I hope to hear of their having been no strife or contention amongst you, except a noble emulation as to who can best work and best agree."

A kindly letter, fatherly in tone, one such almost as the head of a household might address to his children.

The invention of the telegraph marked such a signal advance in the progress of civilization, introducing a new element in the means of communication, as to awaken much controversy during the earlier years of its history. Its real merits were called in question, even the true identity of its inventor was controverted, while savage attacks up alleged high rate of charges were freely indulged in, contentions frequently marked by bitterness of expression and stimulated by feelings of jealousy. In a circular published about January 1, 1850, over the signature of "L. G.," and bearing the title of "The Telegraph Question," its writer comes to the defense of the telegraph. What he says is an interesting contribution to the literature of the subject. It is as follows:

The Baltimore Sun, animadverting upon the recent gross outrage upon the public credulity, in publishing the falsehood that Judge M'Lean, of the Supreme Court, had decided that Prof. Morse's patents were null and void, when the main case had not, in fact, been tried, and no decision had been given, says: "Among the most bitter and malignant opponents of Prof. Morse's interest and his excellent system and right of telegraphing, is the New York Express, which occasionally puts forth some most outrageous falsehoods in regard to the Morse lines.—What is the cause?"

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The New York Express, malignant as it, indeed, has been, is not a sinner above all other newspapers in this matter; we might name many others, who are also acquiring with it a most unenviable notoriety in relation to the Telegraph, and we would whisper in the ears of these our contemporaries, that an indignant feeling now *deep,* but one that ere long will be loud, is universal among the intelligent classes of the community, who cannot but perceive the prejudice and sordidness which lie at the bottom of this persecution; the subject is scarcely ever alluded to without the exclamations, "It is a shame!" "a burning shame!" "a disgrace to the country!" But while there is no excuse for this shameful course on the part of these conductors of the press, it may admit of a species of palliation, but at the expense of the humiliating conviction of their having been made the dupes of one on whom they had relied for their information. In other words, they have been deceived. The promulgator of the falsehood in the present case, if not in many or most of former cases, appears to be Mr. Henry O'Reilly. A letter of his, published in the New York Express shows this conclusively. The original announcement of the falsehood appeared first in the Troy Whig, and then in the Express and other papers. Each of these two, however, upon being questioned in regard to their authority for such an announcement, apply to Henry O'Reilly for explanation, as their voucher. Called upon to substantiate his assertion that "Judge M'Lean had decided that Morse's patent is null and void," he unblushingly re-asserts the falsehood, in the face of proof adduced by him to prove what he asserted, but which directly proves the contrary. He quotes a letter from his counsel, Mr. Gillet, to whom he says he had written "to ascertain the facts beyond all cavil," and what does Mr. Gillet say in reply? "He," (Judge M'Lean,) "had made up an opinion, but had not pronounced it," and had consented to a reargument in July." Taking Mr. O'Reilly's own witness, then, he stands convicted of falsehood. He deliberately published to the world that a case had been tried before Judge M'Lean, and that *"he had decided Morse's Patent to be null and void."* From other sources of unquestionable reliability, we learn the true state of this matter.

There are three suits instituted in Ohio against Mr. O'Reilly and others, by F. O. J. Smith, Esq., one of the proprietors of the Magnetic Telegraph. Mr. Morse is not directly concerned in these suits. Mr. Smith, not Mr. Morse, is the plaintiff. With regard to these suits, if the assertion made in Mr. Morse's letter to the Troy Whig, that *no case* had been tried before Judge M'Lean was *in any degree* an error, it arose from the following paragraph of a letter of the Hon. Senator Chase, one of Mr. O'Reilly's counsel, to Judge Smith, of New York, November 8, 1849. Mr. Chase says:

"As to the stipulation in regard to the Ohio depositions, it did not exactly meet my views and I was too busy to prepare one that would, so the matter was postponed. *It is now certain that the cases cannot be tried before next July* so there will be *ample time* for an arrangement as to the testimony without one.

Yours truly,
S. P. CHASE."

The error, then, was caused on Mr. O'Reilly's side, not on Mr. Morse's; but is it not in fact true that no case had been tried! A single point out of sixteen is not a case. A single point, to wit, the question, Is Morse's American Patent void because it does not bear date from the French Patent? has been under discussion before the Judge, and the argument "is not concluded," and "no opinion has been pronounced," "nothing is decided," and "the case is to be tried next July." One thing is absolutely certain: Judge M'Lean has not decided that Mr. Morse's Patents are null and void.

The Baltimore Sun asks: "What is the cause" of all this bitter and malignant feeling towards Prof. Morse? And well may it be asked; but its answer involves facts not much to the credit of the independence, impartially, or sense of justice of these presses. Their watchwords are, competition, no monopoly, exorbitance, extortion, reduction of Telegraph rates, cheaper telegraphing, &c., and so the end sanctifies the means, and individual rights, character, property, all must be sacrificed that they may have their telegraph despatches cheaper. Disguise it as they may, this is the sordid cause for which the Baltimore Sun inquires.

And what reason is there in this outcry of exorbitance and extortion? Let us examine the matter.

Telegraphing for popular use is arecent thing. It originated with Professor Morse. He first invented a system that made it practicable, and he first carried in into successful operation. No one can dispute these facts. In the first organization of a new system for transmitting intelligence, where a rate of charges for transmission is to be established, whatever that rate may be, it cannot be called exorbitant, for the plain reason that exorbitance in this case implies comparison with other rates, and as there was no system of popular Telegraphs in the world, previously established, there were no other rates with which to compare them. Time, however, has produced other systems and rates of a similar character, and we can now make the necessary comparison.

The American system, as we have said, is the first that was ever popularized. England subsequently popularized her electric telegraph, and still more recently, Prussia, after careful examination of all other systems, has adopted and popularized Morse's telegraph, as the best presented to her consideration, adopting a rate of charges to suit her own exigencies.

We have now, therefore, three popularized telegraph systems in the world—the American, the English and the Prussian, and the charge of exorbitance can now be examined.

The Journal of Commerce, of December 11, 1849, in speaking of the news by the Europa, which was despatched to the New York press from Boston, says: "The despatch consisted of 3,930 words, the cost of telegraphing which was $118." This despatch was sent over the Boston & New York line, a distance of 236 miles. As this line has a higher rate of charges than the average of the 40 other Morse companies, comprising over 11,000 miles of his telegraph, it is at least fair to our opponents to take this as the standard of comparison. Had the despatch consisted of 4,000 words, the cost would have been, according to the tariff of this line, $120.

By the English Telegraph Tariff, 20 words cost one penny or two cents per mile, or one dollar for the first 50 miles; half a penny or one cent per mile, or 50 cents for the next 50 miles, and for any distance beyond 100 miles, one-quarter of a penny or half a cent per mile, being 50 cents each hundred miles beyond the first hundred for every 20 words. The cost, then, of the same despatch in England, would be $418.

But it is stated in the foreign journals, that the Prussian Telegraphic Tariff is "double" in its rates "that of the English rates," consequently, the expense of the same despatch of 4,000 words, would in Prussia, be over $800! The comparative cheapness or exorbitance of telegraphing can be summarily exhibited by stating:

American, Morse's system, 4,000 words, 236 miles..$120
English, Morse's system, 4,000 words, 236 miles.. 418
Prussian, Morse's system, 4,000 words, 236 miles.. 836

But even this startling result of the comparison is not all the truth. Among the most uncompromising assailants of the American Telegraph, those that have been loudest in the outcry for competition in order that telegraph rates may be reduced, are the New York Express, the New York Tribune and the Journal of Commerce. These three journals belong to an association of seven journals, associated to sustain the expense of their telegraphic despatches each bearing one-seventh of the expense, and participating equally in the same despatch; consequently, the expense of each for 4,000 words, is the exorbitant charge of $17.14! Seventeen dollars and fourteen cents by the American telegraph for an amount of intelligence which would have cost them in England $419, and in Prussia $836!

*There is a mistake in reference to the tariff of the New York, Albany and Buffalo line in the above. An established rate from the commencement of this company, has been to charge full price for the first 100 words, and half price for all over; so that for 4,000 words, the regular tariff would be only $61.57, instead of $116.80, or about $8.79 for each of the seven papers.

The same despatch would cost by the tariff of the New York, Albany and Buffalo line but $116.80, or $16.69 to each of the associated press.* If the expense in England were divided and borne by the associated press, the cost to each would be $59.81, or in Prussia $119.62.

We leave the reader to comment on the justice of the stereotyped outcry of exorbitance of American telegraphing.

But we have not quite done with these querulous gentlemen. It is but recently that the facts respecting the high rates of telegraphing in Europe have been announced in the American papers. May we not excuse them, therefore, for their ignorance, and believe that as honorable men, and patriotic withal, they took the earliest opportunity to acknowledge their error, and to sustain the superior advantages of the American system? Let us see. These papers give a paragraph which has "gone the rounds," stating, indeed, the enormous charges of the English telegraph, and then, (are we uncharitable in saying it?) lest their readers should turn upon them and ask the natural question, "how can you denounce the American telegraph rates as exorbitant after this?" they coolly add, "These enormous charges are the result of a close monopoly, which America is happily free from, through the competition of various inventors," leaving it to be inferred, of course, that although it may be true that we have cheaper telegraphing here, it has been produced by competition. Such a statement ought to bring the blush of shame upon their cheeks. If they were ignorant of a fact, the truth of which they might have ascertained in five minutes, and but a few rods from their offices, they are unpardonable in sending forth so injurious a paragraph; if it was wilful and wanton, still more unpardonable.

What are the facts? At the time of the publication of this untruth, there were in operation 11,607 miles or Morse's telegraph, under the direction of 41 companies. Of lines competing with these, only between 7 and 800 miles. This fact alone is sufficient to show that competition could not have produced the cheapness of American telegraphing. But it is a fact well ascertained that the original rates of telegraphing, rates established long before any attempt at competition had been made, or even threatened, are the rates of the several companies now, and if ever they are reduced they will not be reduced from the formidableness of any competition that has yet occurred .

The companies managing the telegraph have no motive for exorbitance in the adjustment of their tariff; they consulted their own interest in consulting the interest of the public; they established their rates with a just consideration of the interest of both; and the best proof that these rates are just is the fact that they have been unchanged from their original amounts by the above attempts at competition, and are the cheapest in the world.

Whether the rates on all the lines may not be reduced to the advantage of both stockholders and the public, is a question which can only be determined by a careful comparison of the amount of business done, and of expenses and receipts. If the business now gives constant employment to the line, the rates cannot, advantageously to the stockholders, be reduced; if the lines are unemployed any length of time, more than sufficient for the necessary rest of the operators, the rates can be reduced with advantage to all. This adjustment can be safely left to the discretion of the several companies, who have every motive which self-interest can suggest, to accommodate the public, especially if in so doing they increase their own gains.

The author fortifies his position by incorporating in his circular statement an "estimated cost of building a line of telegraph from New York to Buffalo," at which estimates, he says, responsible men can be found who will be glad to take the contract for building such a line—distance five hundred miles:

Thirty posts to the mile, at an average cost of $1.25, is $37.50 per mile.....	$18,750.00
Two heavy iron wires, say 600 lbs. to the mile, at 6¼ cents a pound, is $37.50 per mile (much heavier than the wires now in use between New York and Buffalo....	18,750.00
Putting up wire, fixtures, etc., $15 per mile (liberal)	7,500.00
Instruments, office fixtures and furniture...	8,000.00
	$53,000.00
Add:	
Ten per cent. for contingencies, although every allowance is liberal.....	5,300.00
Amount carried forward.....	$58,300.00
Amount brought forward.....	$58,300.00
Use of patentee's right, with the privilege of buying a lawsuit in the United States courts, (large allowance), say.....	20,000.00
(Mr. Bain having repeatedly offered to sell all his title in the United States for $30,000.00.)	
	$78,300.00
Now, the cost of a line of telegraph, as proposed to be built by Mr. O'Reilly at $275 a mile, 500 miles would be.....	137,500.00
Showing a difference of.....	$59,200.00

Which may be considered a pretty liberal allowance for the gentleman's disinterested patriotism in getting up a line that the public have no assurance can be worked after being completed, judgment against such lines of telegraph having been obtained in every instance where they could be brought to trial in Kentucky and Tennessee.

The cost of the present line between New York and Buffalo, built with heavy copper wire at 30 cents a pound, was $180 per mile.

Then he goes on to institute a "Comparison of telegraph charges by the New York, Albany and Buffalo line, and those of some other lines in the United States," as follows:

New York, Albany and Buffalo Line.

150 miles, 10 words, ...	25 cents
300 miles, 10 words, ...	37 cents
506 miles, 10 words, ...	50 cents

Line from New York to Washington.

New York to Philadelphia, 89 miles, 10 words.	25c.	2c.
New York to Wilmington, 119 miles, 10 words.	35c.	3c.
New York to Washington, 245 miles, 10 words.	50c.	5c.

(Not half the distance that it is from New York to Buffalo.)

House & Bain's Lines.

New York to Washington, 245 miles, 50 cents for 10 words, and 5 cents for each additional word. (This is called the cheap line)—Opposition.

Eastern Line.

Boston to St. Johns, 445 miles, for 10 words....	$1.00
Troy to Montreal, 278 miles, for 10 words.....	0.63

Mr. P. B. Delany, the electrical engineer and inventor, an old time and well-known telegrapher, who is summering at Nantucket, Mass., cannot apparently get along without Telegraph Age, for in sending to renew his subscription he writes: "A man without the Age is behind it."

TELEGRAPH AGE is the only telegraphic newspaper published in America. It is up to date, covering its field thoroughly, and no telegraph official or operator can afford to be without it.

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America's Most Expert Telegrapher.

Mr. George W. Conkling, the well-known New York telegrapher, of whom so much is being said regarding his noteworthy feat in telegraphing over 80,000 words of press matter direct to the New York Sun office from the Democratic National Convention, during its recent session at Denver, Colo., is the chief operator of the entire telegraphic news bureau of that newspaper, otherwise known as the Laffan Bureau.

Working over a wire that stretched more than half way across the continent, about 2,500 miles, Mr. Conkling attained the high average speed of 3,136.20 words an hour, or 52.27 words to the minute, a record which has never before been

GEORGE W. CONKLING
America's Most Expert Telegrapher.

equalled anywhere for such extensive service, not even over short lines. To be exact, Mr. Conkling in just twenty-eight working hours sent over this wire to the Sun by the Morse system and using the Phillips Code, a total of 73,000 words, an average of 2,607.14 per hour. Much of this matter was sent from a seat in front of the Speaker's stand in the convention hall, while pandemonium was being raised, a severity of conditions telegraphers will recognize. Some of his greatest feats in transmitting are here enumerated: 14,750 words in five hours and twenty-three minutes; 8,100 words in two hours and forty-five minutes; 5,750 words in one hour and fifty minutes, and on the last day of the convention session the "clean up" matter counted up to 10,370 words transmitted in three hours and twenty minutes, an average of over 3,100 words per hour.

The receiving of Mr. Conkling's terrific rush was performed by Harry R. Clark on a typewriter. No breaks were recorded against Mr. Clark. The only interruptions were due to wire troubles of which the wire was almost entirely free, the weather conditions being almost perfect. The records both in sending and receiving were also marked by endurance as well.

Mr. Conkling has long been regarded as being probably the speediest perfect Morse sender in the United States. He has participated in several telegraphic tournaments in which he has acquitted himself handsomely. In the Philadelphia tournament, in 1903, he won a silver loving cup awarded in a special contest to the most perfect Morse sender. On the same occasion he also successfully defended his title of champion code sender which he won in 1898, winning also the second prize in the Championship of America class. In winning fresh laurels in the field of actual work as a fast and most accurate sender, Mr. Conkling has been the recipient of many congratulations.

Mr. Conkling is still a comparatively young man, not yet thirty-seven years of age, having been born on December 22, 1871. He is a man of fine capabilities, of clean habits and of recognized force in telegraph circles. Learning telegraphy when but fifteen years of age, he has since pursued it both as a student and as an operator. He has been educated in all branches of the telegraph—railroad, commercial, broker, press and has had some experience in the fields of cable and wireless telegraphy, so that he brings to his present position as chief operator of a great newspaper an all-around training that is standing him in good stead.

The Old Time and Military Telegraphers' Reunion.

The joint re-union of the Old Time Telegraphers and Historical Association and of the Society of the United States Military Telegraph Corps, which will meet at Niagara Falls on September 16, 17 and 18, bids fair to attract not only a large attendance, but one signally representative in character. This will be especially true of the military telegraphers, for it is announced that among those expected to be present will be Colonel Robert C. Clowry, president and general manager of the Western Union Telegraph Company; Colonel William R. Plum, the historian of the military telegraphers; Charles A. Tinker, formerly general superintendent of the Eastern division of the Western Union; Colonel William B. Wilson, president of the society, and David Homer Bates, its secretary. All of those named had enviable war records, holding positions of much responsibility, the character of which is well-known to readers of Telegraph Age. Their meeting together on so auspicious an occasion as that of the re-union, when it is hoped many others, who also served with conspicious fidelity and ability in promoting the cause of the Union in the department of its field telegraphy will be present to meet these leaders in social fraternization.

The officers of the Society of the United States Military Telegraph Corps are: Colonel William B. Wilson, Holmesburg, Philadelphia, president; William L. Ives, New York, vice-president; D. H. Bates, 658 Broadway, New York, secretary and treasurer. The circular letter sent out some-

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time ago by Mr. Bates, addressed to comrades within his organization, before published in Telegraph Age, and which is once again printed herewith, has aroused much interest in the coming meeting, even among the old-time telegraphers, and many are looking forward to the coming event with eager anticipation.

Mr. Bates' circular is as follows:

Colonel William B. Wilson, our president, believing that our re-union at Niagara Falls this year should be a large and impressive one, will, with the assistance of the executive committee, use every effort to bring about that result. In view of this he has appointed the following committee to act in conjunction with the president and committee of arrangements of the Old Time Telegraphers' and Historical Association, whose headquarters are at Buffalo, N. Y.:

George A. Burnett, chairman; Joseph Anderson, Madison Buell, and Thomas A. Laird, Buffalo, N. Y.; James K. Parsons and Harry L. Gregg, Rochester, N. Y.; Joseph Schnell, Binghamton, N. Y.; George J. Goalding, Erie, Pa., and I. McMichael, Toronto, Ont.

It is desirable that your committee see that proper arrangements are made to the end that the dignity and importance of the historic services of yourself and comrades are fittingly recognized.

The officers of the Old Time Telegraphers' and Historical Association are: Harvey D. Reynolds, president, Buffalo, N. Y.; George A. Burnett, Buffalo, N. Y., I. McMichael, Toronto, Ont., and George F. Macdonald, Ottawa, Ont., vice-presidents; John Brant, secretary-treasurer, 195 Broadway, New York.

The official headquarters of the re-union will be at the Cataract-International Hotels, at Niagara Falls, a view of which is shown in the advertisement, published in another column, of this fine hostlery, which is conducted under a single management.

The programme of entertainment will be practically the same as that determined upon for last year, postponement of the affair at that time preventing its fulfilment.

John Brant, 195 Broadway, New York, the secretary of the Old Time Telegraphers' and Historical Association, will be pleased to answer any questions regarding the coming meeting.

LETTERS FROM OUR AGENTS.

With evidences of returning prosperity beginning to appear, indicating that the tide of business has reached its ebb, and that at last the flow may now be expected, it is hoped that the agents everywhere of Telegraph Age, with an aroused interest, will resume the sending of letters for publication in this journal. We cordially invite correspondence. The great telegraphic fraternity of this country, so closely akin, is interested in the coming and going—in the life of the profession, in the keeping in touch with the movements of individuals, so that space devoted to such a chronicle is, we believe, well dedicated to that purpose. It is hoped that excuses for non-writing offered by our agents on the plea that time will not permit such correspondence, will be brushed aside. Let us have a generous response. A presentation of facts occurring in numerous offices will make an interesting page, alike pleasing to those whose contributions make it possible, and attractive to our great body of readers scattered broadcast over this country. The telegrapher in New York "wants to know" what his brother telegrapher in Chicago, in St. Louis, in New Orleans, in San Francisco, and other points, is doing and what he is interested in, and vice versa.

CHICAGO WESTERN UNION NOTES.

Miss Josie Kinsella, of this office, and Patrick McCarthy, of Litchfield, Minn., were married recently.

The death of Mrs. Louis Casper, on July 17, has caused a good deal of sympathy to be expressed for her husband an electrician of this company, who is well known in electrical circles throughout the country.

NEW YORK WESTERN UNION NOTES.

The recent death of the father of John F. J. Hopkins, assistant eastern wire chief, has caused much genuine sympathy to be extended to the son.

T. A. McCammon, chief operator, has returned from his outing passed in Canada, the land of his nativity. If a clear eye and a liberal coat of tan be accepted as an indication, Mr. McCammon must have spent a good share of his time in the open.

While it is true that many new faces are to be observed in the operating room, the fact nevertheless remains that a large percentage of old timers are still to be found busily engaged at the key, some of them with an experience dating back to cover a period of many years, occasionally twenty and even thirty being to their credit.

This is preemiently the vacation month, and a number of the chiefs and others are away seeking recreation at the seashore or among the mountains. As time limits expire and one after another returns, bronzed faces give abundant evidence of health recruited, and glowing accounts of out-of-door life, in which sailing excursions or valorous deeds performed in fishing on the recitals of many a leisure moment.

New York Items.

Mr. Dennis F. Brown, of the Western Union Telegraph Company, at Washington, D. C., passed through New York recently on his return from the convention of the Knights of Pythias, which was held at Boston.

The Magnetic Club Omits its Outing.

The Magnetic Club, of New York, gives publicity to the following resolution recently adopted by the Governing Committee: "That the dues for the current year be remitted, and the secretary be and hereby is directed to notify the members that while it had been decided to omit the regular summer outing of the club this year, the regular fall dinner would be held as usual."

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Frank C. Mason to Welcome His Friends.

For many years Frank C. Mason, the well-known old time telegrapher, was a resident of Brooklyn, there holding for a long period the position of superintendent of police telegraph. Resigning two years ago, he retired to his country place, Glen Alex Farm, at Washington Mills, near Utica, N. Y. A view of his attractive home is shown herewith. As a municipal electrician and old time telegrapher, his connection with the respective associations of each remain unbroken. His friendships in both are many. As his place is situated on the direct line of travel to Detroit and Niagara Falls, the places of meeting selected this year for the two organizations named, he is opening his house at the time of both occasions to as many of his old companions, going or returning, who may desire to stop off and give him a call. Mr. Mason's hospitality is unbounded, and many no doubt will gladly accept his invitation.

THE RESIDENCE OF FRANK C. MASON, WASHINGTON MILLS, N. Y.

Speedy Postal Operators at the Denver Convention.

EDITOR TELEGRAPH AGE:

In a recent article in Telegraph Age, reference was made to speedy work on press matter done by Western Union operators, by The Associated Press and by George W. Conkling. The reporter responsible for the write-up forgot all about the Postal, when Mr. Lawton of the Denver Western Union office had finished with him.

The Denver Postal did have stars of her own, and these were augmented by a dozen or more of the very fastest men in the business, brought in from Chicago and elsewhere. Roscoe Johnson, a Boston product, and as perfect a Morse sender as one ever listened to, sent six thousand five hundred words direct to the New York Herald in two hours and thirty-five minutes. Bernie Goetthelp, recently of Memphis, and now with Logan and Bryan, Chicago, sent sixteen hundred words to the same paper in the incredibly short time of thirty-one minutes. Messrs. Bruckner, Simpson and Walsh, a Chicago trio, sent twenty-two thousand words to the Chicago-Record-Herald, in three hours flat. Copy was fed to them by Dave Hamilton, Postal manager at the Chicago Record-Herald office, who was sent to Denver to look after his paper's interests, and there were spells when he ran out of copy. This gives the remarkable result of 7,333 words an hour, or an average of 2,444 words per man per hour. And it must be remembered none of these men were trying for records, simply moving the business as it came to them to the best of their ability.

With the Postal company at the convention were such men as W. R. Wilson, chief operator, of the Denver office of Logan and Bryan; Messrs. Muller, Stokeley, Kinley, and Ellis, of the same concern; Charlie Hinman, known everywhere as a wonderful operator, and a host of others, each of whom gave good account of himself. Every man was a brilliant operator, or he had no place in the Postal ranks at a time like the Denver convention when facilities were naturally limited and talent of the highest order demanded.

ONE OF THEM.

H. C. Wilson, Superintendent of the Jamaica, W. I., Telegraph System.

Mr. H. C. Wilson, of Kingston, Jamaica, government superintendent of telegraphs for that island, recently passed his vacation in this country, spending his time mainly in New York and Boston, Mass. He sailed on his return home from the latter place, August 8. Mr. Wilson, because of his long association with the telegraph has many friends, both in the commercial and cable services. He was born at March, Cambridgeshire, England, in 1854, and entered the telegraph service when only twelve years old, with the Electrical and International Telegraph Company. He went to the Midland Railway in 1868 as telegraph clerk, and joined the submarine cable service in 1870, serving the Eastern Telegraph Company at Alexandria and Suez, Egypt, until 1873. He joined the forces of the India Rubber and Gutta Percha Telegraph Works, going on the cable steamer "Dacia," early in 1873, and was engaged in laying and picking up cables in the West Indies until 1874, when he went to Pernambuco for the Western and Brazilian Telegraph Company. He left the service at Bahia in 1877, and retired from the cable field to go to Jamaica, where he married. Fondness for his old profession led him to accept from the British government an offer to construct around the island of Jamaica its first system of telegraphs. This was started in 1879 and has been gradually extended with the addition of a limited telephone system. There are about one hundred operators in seventy-eight public offices working "open circuit" over about one thousand miles of wire. The system is unusually well conducted. During the earthquake Mr. Wilson was precipitated from the second floor of his house into the cellar and sustained severe injuries to one of his legs. Many of the staff were killed and the offices were destroyed, but Mr. Wilson with wonted energy has put the service back into good condition, in spite of the difficulty of securing funds adequate to the work.

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Mr. Wilson is a man of broad study and experience, and while in this country familiarized himself with the latest lighting and power developments. His health was greatly affected by the accident and by financial losses, but he has now thoroughly recuperated.

Obituary.

Donald Holmes, twenty-eight years of age, who was recently killed in an automobile accident at Bogata, N. J., was the son of the late W. J. Holmes, formerly superintendent of telegraph of the Erie railroad.

Colonel N. C. Pamplin, for thirty years manager of the Western Union Telegraph Company at Norfolk, Va., but who retired from active business two years ago, since which time he has been a resident of Philadelphia, died August 6, at Pamplin City, Va., whither he had gone on a brief visit. Col. Pamplin was born in the city in which he died sixty-five years ago. He leaves a wife and one son. In his profession he was one of the brilliant "old-timers" and had a remarkable war record. As the right-hand man of the chief of the Confederate telegraph service at the most important point, he discharged with signal skill and loyalty responsibilities which included custody of the most important war secrets of the Confederate Government. In Norfolk, Col. Pamplin had been a member of the Local Board of Brambleton Ward, a member of the School Board, and a member of the City Council. In all of these important capacities he served with characteristic ability.

Iowa's Incorporation Law.

The law under which the Western Union Telegraph Company is being sued in Iowa for $898,500, is known as the incorporation law, and provides that a foreign corporation desiring to operate within the state shall pay a fee of $25 for the first $10,000 of its capital stock and an additional fee of $10 for every $1,000 of the authorized capital in excess of the $10,000. Domestic corporations are similiarly taxed, so there is no tax levied upon the non-resident which is not imposed upon the citizen corporation.

Furthermore in the case of non-resident corporations the law provides that each of them desiring to do business in the state shall file with the secretary of state a copy of its articles of incorporation together with a duplicate copy of the resolution passed by the corporation's board of directors requesting the right to do business in Iowa. Failure to abide by the provisions of the law renders the non-resident corporation which does business there liable to a fine of $100 a day for each day that it thus does business unlawfully.

Mr. Joseph Marshall, chief operator of the Western Union Telgraph Company, Savannah, Ga., expresses a high opinion for this journal. He writes: "Herewith is a money order for another year's subscription. My name has been on your books since 1883, and I hope to take Telegraph Age as long as I live. You paper is gotten up in first-class shape, and is interesting from cover to cover."

The Royal Standard (Visible) Typewriter. One hundred dollar value for sixty-five dollars. Standard keyboard. Absolutely best "mill" for commercial, railroad or press work. Easy monthly payments. Rents for three dollars per month. Send for booklet. Address me personally, D. A. Mahoney, Royal Typewriter Co., 253 Broadway, New York.

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WANTED.—Information as to whereabouts of Operator E. J. Hamilton. Address "S," care Telegraph Age, New York.

Will buy or sell, in one to ten-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

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Easier to break on than pressing a typewriter key.
Splendid exercise for paralysis.
Improves appearance of typewriter.
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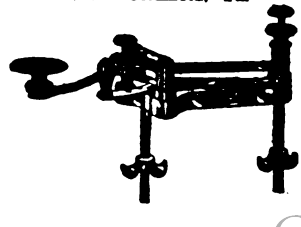

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Great North Western Telegraph Co. of Canada, Geo. D. Perry, purchasing agent, Toronto, Ont.

North American Telegraph Co., H. A. Tuttle, general manager and purchasing agent, Minneapolis, Minn.

Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

Postal Telegraph-Cable Co. of Texas, S. M. English, general manager and purchasing agent, Dallas, Tex.

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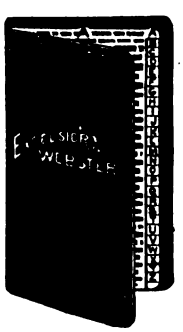

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Wheatstone Bridge, F. W. Jones .....Nov. 16, 1906
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Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Detroit, Mich., August 19, 20, 21.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

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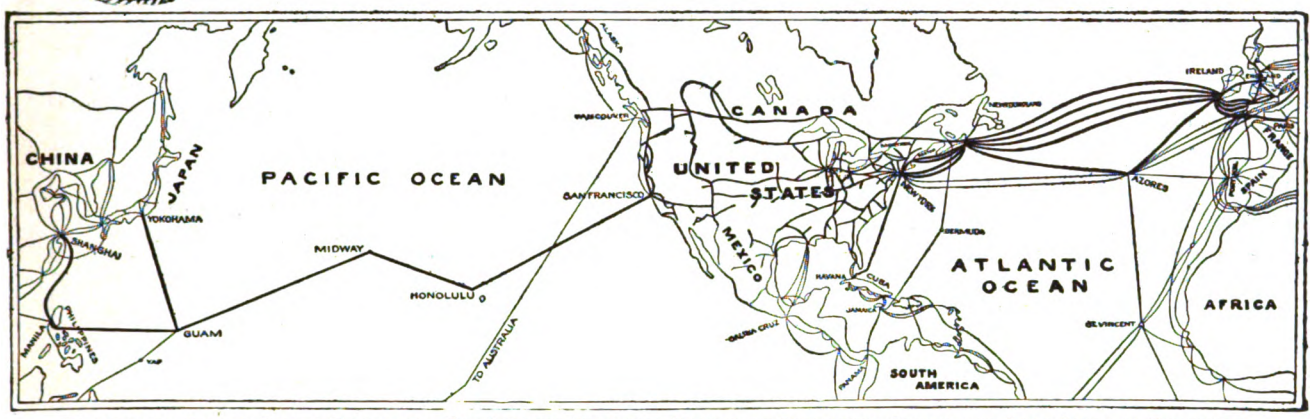

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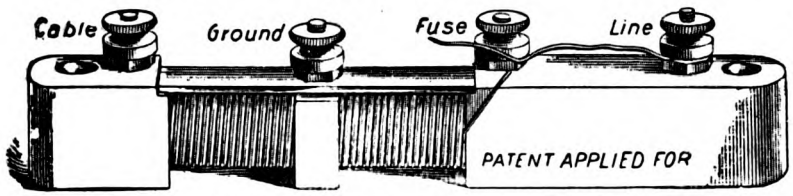

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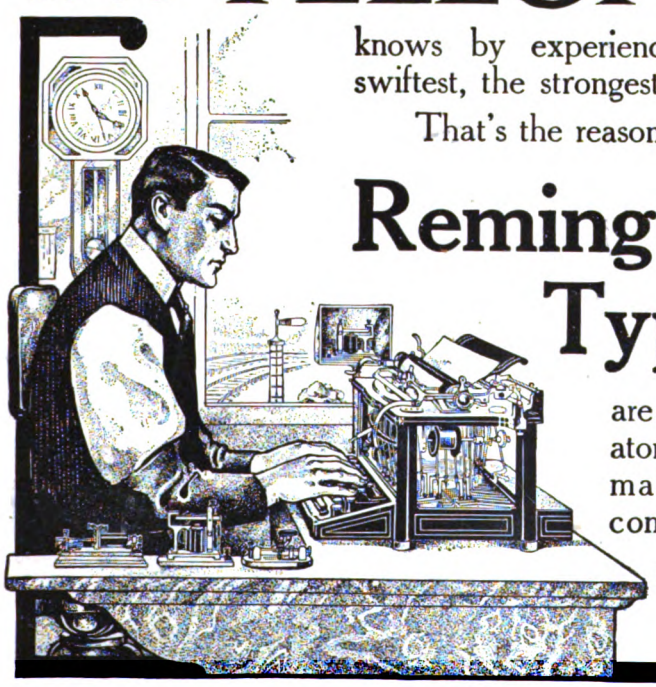

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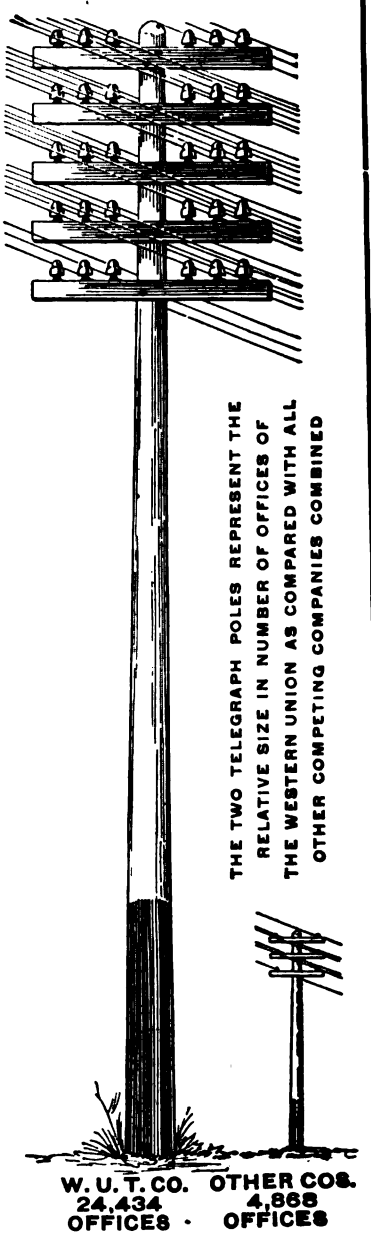

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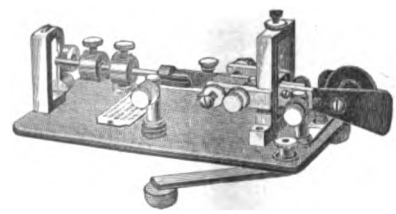

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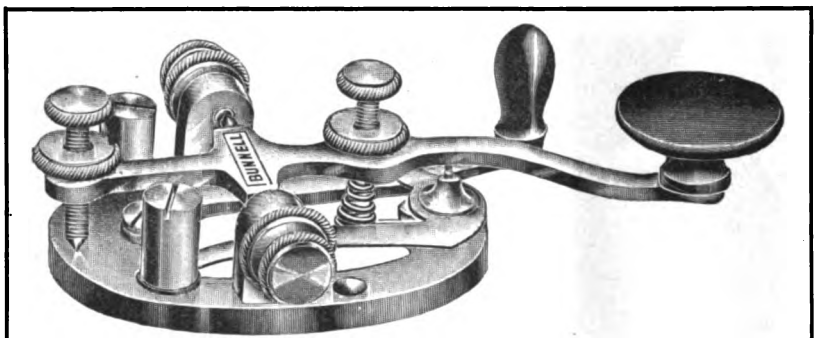

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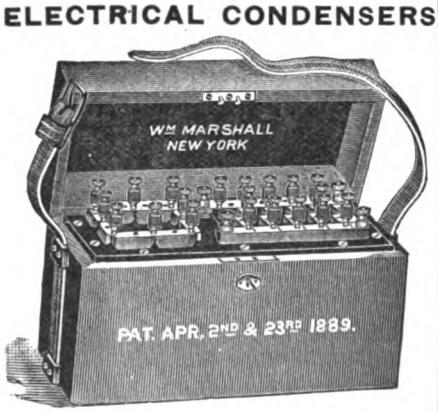

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SOME POINTS ON ELECTRICITY.

The Mercury Arc Vapor Rectifier.

BY WILLIS H. JONES.

A rectifier, as the name implies, is something that corrects what is wrong.

In the electrical line it is a device by means of which electric impulses which normally flow in a wrong direction are for practical purposes caused to alter their course and travel in the route of usefulness. In other words the rectifier creates direct currents out of alternating currents and is therefore a very useful and necessary piece of apparatus for telegraphic purposes in localities where alternating currents only are to be found, as is the case in many small towns, where electric light and power companies supply nothing else.

As the rectifier is rapidly being installed at various places throughout the country for the purpose of providing direct currents for local batteries, charging storage batteries, etc., a description of and its mode of operation may be interesting to those who have to handle it.

The rectifier proper consists of a mercury vapor arc enclosed in an exhausted glass tube, the general shape and appearance of which is shown in Fig. 1. It possesses four metal-tipped legs, three of which are connections for graphite anodes and one for a mercury cathode. A few words concerning the theory involved in the operation of the rectifier will explain the necessity for more than one anode.

It seems that mercury vapor normally possesses so great a resistance to the passage of a current through it that it practically constitutes an insulator except for exceedingly high voltages regardless of the polarity thereof. Yet it is nevertheless possible through a certain treatment of this vapor to create therein a condition whereby it becomes a good conductor for currents in one direction only, while at the same time preserving its original attitude of opposition to currents headed in the opposite direction. This condition is created by simply using a mercury electrode for the cathode. With this arrangement the vapor becomes ionized and in that state allows the passage of a current through it, but, as previously stated, in one direction only. Ionized vapor also enables comparatively low voltages of one polarity only to sustain the necessary arc required in

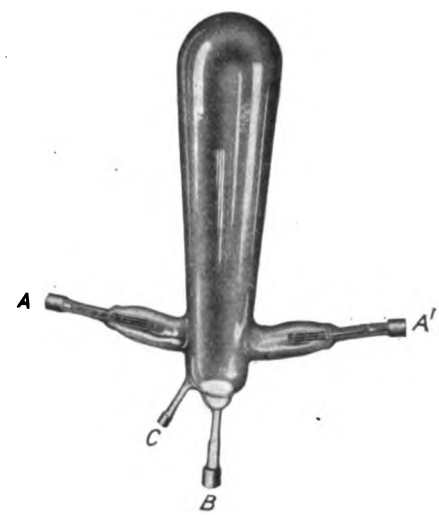

FIGURE 1—THE RECTIFIER TUBE.

the tube and in like manner persistently ignores the opposite impress of the reversed polarity.

Now the "right of way" this treated vapor prescribes for the passage of a current through its domains, is strictly from the positive source anode to the cathode, and as the two terminals of the supply transformer coil alternately become positive with each half wave, a second anode is obviously required in order to catch the positive supply at the other terminal, to which point it jumps, and thus continue the same polarity of current through the cathode and external circuit during the complete cycle. Hence two anodes are required in order that the cathode may be constantly in connection with the positive supply regardless of which terminal of the transformer coil that polarity happens to be.

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It will thus be seen that the rectifier utilizes and derives the benefit of a full electric wave instead of half of it as might be expected. The resulting current is, therefore, unidirectional because the positive polarity supply alone is constantly pursued from one terminal of the transformer coil to the other as the alternations occur and thus relentlessly pressed into continuous service.

THE ARC AND REACTANCE COILS.

Obviously the continuity of the arc during the complete cycle must be preserved in order to maintain a continuous flow of current.

Now while a comparatively low voltage will sustain it, the pressure gets so low at or near the instant the current in reversing passes the zero point that the arc will die out unless a compensating remedy is provided for the purpose of bridging over the gap thus created.

This feat is accomplished by means of a duplicate set of reactance coils, one for each arm of the circuit, the reactance of which causes a like-directed current of its own creation to temporarily replace the vanishing current and thus sustain the arc until the new wave from the transformer has had time to again build up to an efficient value and resume duty.

The reactance current also tends to smooth out the wave which would otherwise be pulsatory in nature with very abrupt breaks.

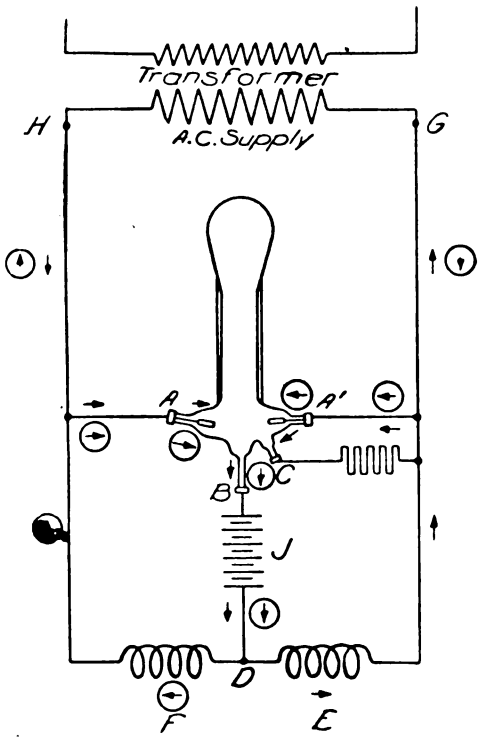

FIGURE 2—THEORETICAL CONNECTIONS.

The operation of the mercury arc rectifier will be understood by the following description given by the General Electric Company, shown in Fig. 2. Assume an instant when the terminal H of the supply transformer is positive, the anode A is then positive and the arc is free to flow between A and B, B being the mercury cathode. Following the direction of the arrows still further, the current passes through the load J, through

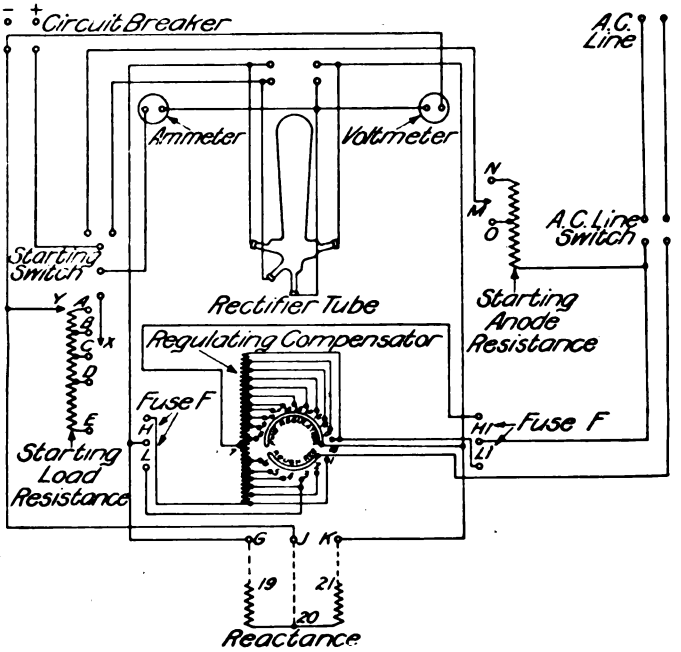

FIGURE 3—ACTUAL CONNECTIONS.

the reactance coil E and back to the negative terminal G on the transformer. A little later, when the impressed e.m.f. falls below a value sufficient to maintain the arc against the counter e.m.f. of the arc and load, the reactance E, which heretofore has been charging, now discharges, the discharge current being in the same direction as formerly. This serves to maintain the arc in the rectifier until the e.m.f. of the supply has passed through zero, reverses and builds up to such a value as to cause A' to have a sufficiently positive value to start an arc between it and the mercury cathode B. The discharge circuit of the reactance coil E is now through the arc A', B, instead of through its former circuit. Consequently the arc A', B is now supplied with current, partly from the transformer and partly from the reactance coil E. The new circuit from the transformer is indicated by the arrows enclosed in circles.

Figure 3 is a diagram of the mercury vapor rectifier showing the actual connections and means for arranging the resistance for different outputs.

Printed instructions explain how to make the combinations for a given output by connecting certain numbers together.

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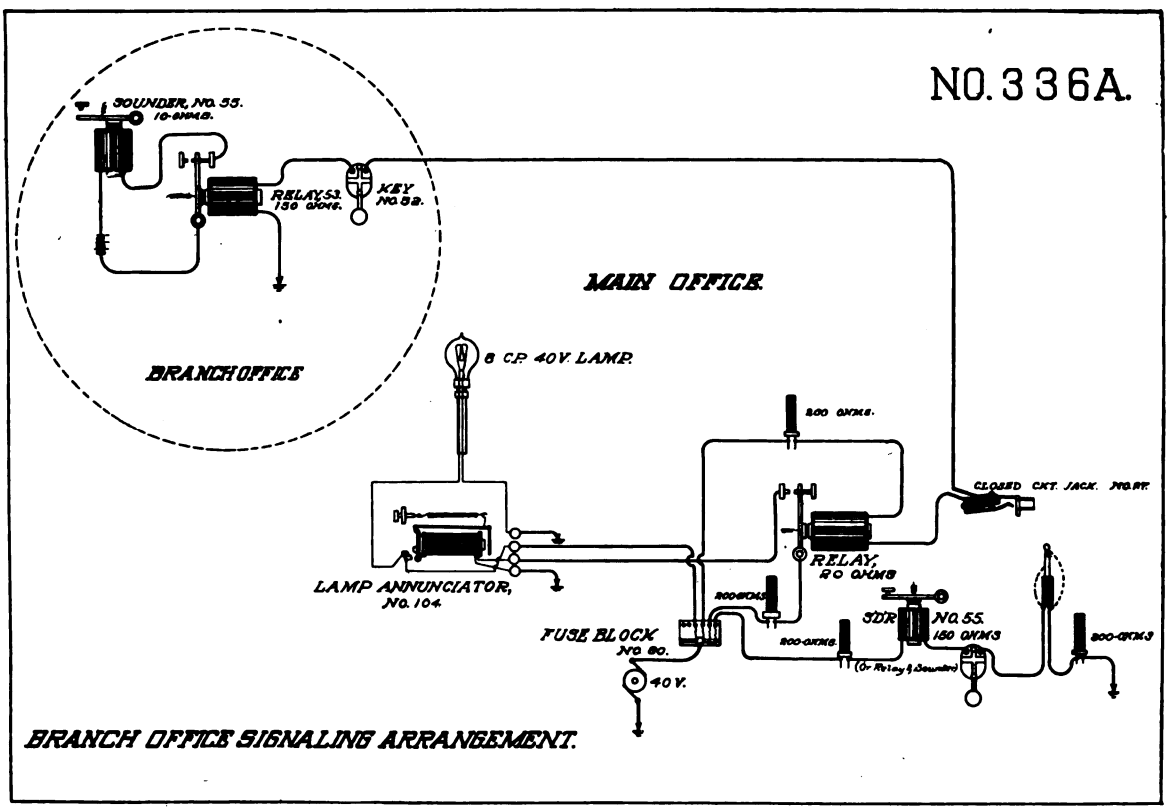
Postal Telegraphic Apparatus.

[Under this head there will frequently appear in Telegraph Age an illustration and descriptive account of some feature of the equipment of the Postal Telegraph-Cable Company, prepared by John F. Skirrow, associate electrical engineer of the company.]

The accompanying diagram shows a method employed by the Postal Telegraph-Cable Company for operating short wires from a main office to branch offices, where the service is such that an operator is not assigned to the circuit continuously. It will be seen that the arrangement is such, however, that the system can be applied to any circuit.

A lamp annunciator is placed upon the operating table at the main office. This annunciator is



BRANCH OFFICE SIGNALING ARRANGEMENT.

controlled by a back contact relay. When the line circuit is opened at the branch office the armature of this relay falls back causing the annunciator to drop and light the lamp. The lamp remains lighted until the drop is restored. When the main office operator answers the call he plugs in a Morse set, and in so doing switches the annunciator relay out of the line circuit but connects it through a resistance to ground. This returns the armature of the annunciator relay to its normal position so that the drop may be restored and the lamp extinguished as soon as the call is answered. When the operator cuts out the plug after receiving a message the annunciator relay is again placed in the line circuit.

In practice several such annunciators are often grouped upon one table and one or more operators are assigned to answer the calls as they come in.

Recent Telegraph Patents.

A patent, No. 894,820, for telegraphy, has been issued to Patrick B. Delany, of South Orange, N. J. A system of telegraphy in which a plurality of dots are transmitted by a single key depression. Makes use of relays having weighted armatures adapted to vibrate with a certain periodicity.

A patent, No. 894,167, for a keyboard has been granted to Adolph H. F. Schaar, of San Francisco, Cal. There are a number of pivoted transmitting key levers, each having a contact point at one end, a bar provided with a number of contact points, one for each of the levers, and means for closing an electrical circuit through either of the points when its key lever is actuated, and means for locking the levers when circuits are so closed.

A patent, No. 894,836, for receiving telegraphic and telephonic impulses simultaneously, has been granted to Isidor Kitsee, of Philadelphia. In a line of transmission, a telegraphic receiving device inserted in series thereto, condensers shunting said receiving device, in combination with an inductorium, one coil therefor connected to said condensers and forming part of the shunt around said receiving device, the other coil connected to a telephonic receiver.

A patent, No. 895,869, for a rectifier system, has been issued to Ossias O. Kruth, of Schenectady, N. Y. The insertion of reactance displaces the phase of one of a number of transformers supplying a mercury-arc rectifier.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part VI.)

THE TRANSMITTER—CONTINUED.

The transmitter, as is well understood, is designed to replace ordinary hand signaling and automatically transmit to line a series of rapidly reversed currents. The duration and polarity of these currents for signaling purposes are, as previously intimated, determined by the punched tape, which in reality mechanically regulates their flow and direction in much the same way as it is accomplished manually, only with much greater speed and precision.

The current reversing arrangement for producing the signals is shown to the right of Fig. 21, where L represents an upright lever having platinum contacts placed equidistant on opposite sides of its pivotal point, and which are alternately brought into contact with the upper and lower stops D and D', whenever the transmitter mechanism is set in motion.

These stops are respectively attached to the marking (—) and spacing (+) dynamo machines, while lever L is connected to line, so that when the transmitter is running free of slip, a series of positive and negative currents flow out to line with a regular frequency that is varied in practice from fifty to seventy reversals per second.

When the punched slip is inserted, this regularity of reversal is destroyed, and the movements of the lever become such as to cause the latter to linger upon one or the other of the dynamo stops for varying periods, thus producing contacts of dot or dash duration, and sending out currents for corresponding intervals of time and of the polarity required for the production of signals upon the distant receiving apparatus.

A general idea of the manner in which these results are brought about will be understood by reference to Figs. 21 and 22, the latter of which shows the perforations requisite for the letter "e" on the punched paper, as well as the corresponding signals produced upon the received slip.

When the transmitter clock-work is started, the beam RB is caused to rock at its center, and an up-and-down movement is communicated to the upright steel rods or needles M and S. These needles are hinged on the rocking levers A and A', which are pivoted at the angles, and become alternately depressed through the action of the rocking beam. The latter is provided with two projecting pins p and p', which normally press downward against the horizontal arms of levers A A', which are in turn pulled upward against

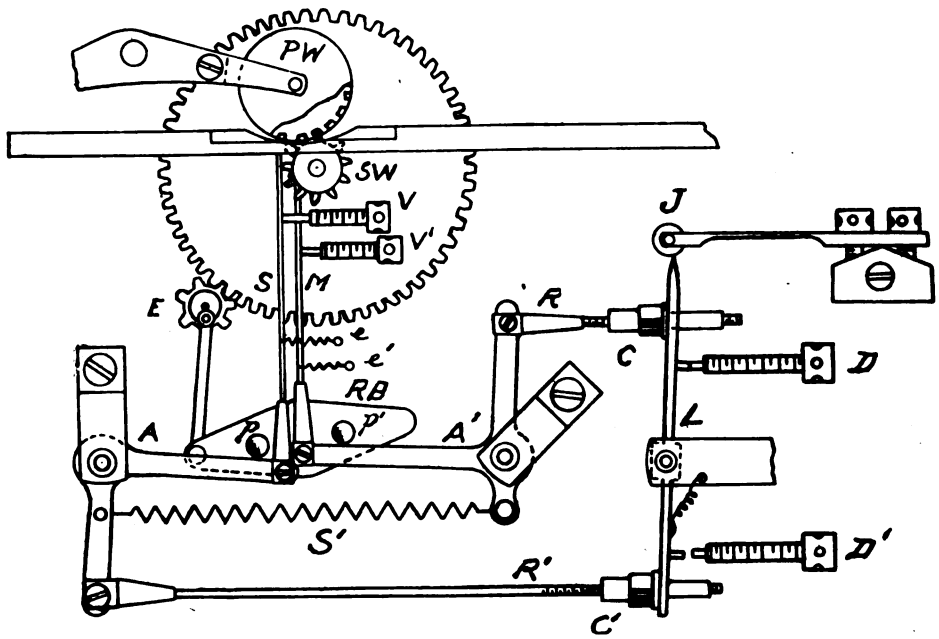

FIG. 21—SIGNALING ARRANGEMENT OF TRANSMITTER.

the two pins under the influence of the spiral spring S', whose tension is made sufficiently great to ensure rapidity of action.

Affixed to the arms A A' are the horizontal rods R and R', which, respectively, pass through a hole in the upper and lower part of lever L at equal distances from where it is pivoted, so as to enable the lever to be shoved either to one or the other side of its central position by the small collet C or C'. These collets are screwed on the rods R and R' and should be so disposed as to nearly touch the lever when its upper end stands directly beneath the center of the jockey roller J.

From what has been described it will be evident that the rocking of the beam RB will impart a vibratory motion to the lever L, causing it to strike first one and then the other of the dynamo posts and thus transmit to line the series

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of reversals of which previous mention has been made.

If, now, the punched slip (Fig. 22) be inserted in the transmitter, the unpunched part of the paper will at first prevent the needles m and s from ascending sufficiently far to allow the reversing lever to continue in vibration. But when the first of the upper holes (m) comes directly above the rod M, the latter will then pass freely through the perforation, and as a result of this the lever will be thrust by collet C into contact with the upper stop D, and a negative or marking current will flow to line.

This current will attract the armature of the distant receiving apparatus, which we will assume is a Wheatstone receiver, and bring the inking disk connected with it into contact with the received slip and mark the paper. When the reverse movement of the rocking beam takes place the rod M will be withdrawn, and rod S will in

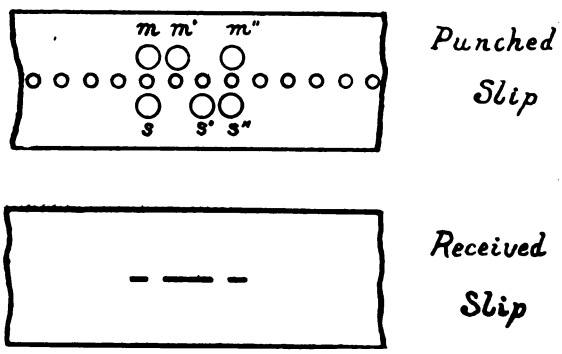

FIG. 22.

turn rise and project through the first of the lower holes (s). This will cause the lever L to be thrown over to the opposite side and establish contact between it and the lower stop D', and a positive or spacing current will be sent to line. This reversal of the current will remove the inking disk from the received slip and a dot will thus have been recorded.

The spacing current then continues to hold the ink wheel away from the recording slip until the rod M enters the next upper perforation m' and sends a marking current to line. The distant armature is again attracted so as to bring the marking wheel against the paper, where it now remains until the spacing needle S rises through the lower hole s', and thus reverses the current and withdraws the armature. For it will be seen that during this interval, or while the punched ribbon is traveling through the transmitter from m' to s', the upward tendency, first of needle S, and then of needle M, becomes checked or hindered by the unperforated portion of the paper which lies directly under m' and above s'.

Lever L is accordingly prevented from making a reversal, or, in other words, the position assumed by the lever after the needle M has passed through the hole m' remains unaltered, and the marking current due to that position is continued to line until the spacing needle enters hole s' and changes the polarity of the current. In this way the marking current is increased to one dash duration, which is immediately succeeded by another of dot duration when the needles M and S in the course of their further movements pass through the remaining perforations m'' and s'', thus completing the letter "e" of the printing code.

The center perforations are in no way concerned in producing the signals, but are formed for the purpose of admitting the teeth of the little star wheel SW (Fig. 21), which is rotated by the clock-work in order to urge forward the paper in passing through the transmitter. The star wheel is geared to lie between the two upright needles and carry the perforated slip forward from right to left, so as to meet the upward direction of the needles, which takes place when the larger circles in the perforated paper pass immediately above the ends of the needles.

The adjustment of each of the latter must be such that it commences to enter a perforation just when the left-hand edge of the opening is sufficiently clear of the corresponding edge of the needle to allow the latter to pass freely through the holes, otherwise the needles will catch against the side of the perforations.

The proper regulation may be secured by means of the screws V V', which are normally adjusted to admit of needle S being slightly to the left of needle M, as illustrated in Fig. 21. The small spiral springs e e', are for the purpose of pulling the needles back into their normal position against screws V V', just as soon as they are sufficiently clear of the slip to enable the springs to come into action.

(To be continued.)

The Western Union Brings Suit Against the Baltimore and Ohio Railroad Company.

An amicable suit was instituted in the United States Circuit Court in Maryland on August 1, by the Western Union Telegraph Company against the Baltimore and Ohio Railroad Company to have decided the question whether the Hepburn act for regulating commerce between the telegraph and the railroad companies for the mutual maintenance, operation and control of certain lines of the telegraph company.

The agreement in question was made October 15, 1887. It provided that the telegraph company should transmit free of charge business messages of the railroad to an amount not exceeding $10,000 a year, and charge half rates on all messages in excess of that sum. The telegraph company also agreed to pay the railroad company $60,000 a year in monthly installments of $5,000. The railroad company agreed to transport free of charge employes of the telegraph company when engaged in the company's work and also all material and supplies. Half rates were to be charged by the railroad on all transportation in excess of $10,000 a year.

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The contract was carried out by both companies, the bill of complaint states, until October 1, 1906, when the telegraph company was notified by the Baltimore and Ohio Railroad Company that the railroad company, because of the Hepburn act, would be forced to collect in full for transportation of telegraph company employes and supplies.

It is alleged in the bill that the railroad company has misconstrued the Hepburn act and that it does not justify a breach of the contract with the telegraph company.

The court is asked to require the Baltimore and Ohio Railroad to carry out the contract.

Personal.

Mr. J. B. Korndorfer, the well known New York telegrapher, until within about four years ago manager of the Greenwich street office of the Western Union Telegraph Company, has been appointed cashier of the People's National Bank located in the Borough of Brooklyn, New York.

Mr. David Homer Bates, of New York, secretary of the Society of the United States Military Telegraph Corps, lately spent a very delightful vacation of two weeks at Lake Sunapee, New Hampshire, on the banks of which was located the summer home of John Hay, the late Secretary of State.

Mr. N. M. Booth, the veteran telegrapher who resides at Evansville, Ind., in a recent note writes to say that he has recovered from his severe illness, an event which served to assemble his entire family, bringing to the father and mother in the old home seven children, all getting together for the first time in twenty-five years. Mr. Booth will be eighty-three years of age on September 7.

Mr. A. W. Orton, a well known business man of Rome, N. Y., formerly an old-time and military telegrapher, was a recent New York visitor, while en route on a business trip South. It will be remembered that Mr. Orton recently contributed an article to Telegraph Age, relative to the late William Orton former president of the Western Union Telegraph Company. Mr. Orton has since been in receipt of numerous letters from various members of the Orton family expressing their pleasure at the appearance of the article in question, and thanking him for the comprehensiveness and accuracy of the historical data contained therein.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Among recent visitors to this office were Shirley M. English, general manager of the Postal Telegraph-Cable Company of Texas, of Dallas, Tex., who was on his way East to spend a vacation in Boston; others were William J. Camp, of Montreal, electrical engineer of the Canadian Pacific Railway's Telegraph; Superintendents Leona Lemon, of Philadelphia; Charles E. Bagley, of Pittsburg; A. L. Edgecombe, of Boston; H. D. Reynolds, of Buffalo, and Manager George E. Taylor, of Warren, Pa.

Mr. E. B. Pillsbury, general superintendent, is spending his vacation in Boston, his former home immediately prior to his coming to New York.

Mr. Edson Kimmey, superintendent, at New York, has returned from a trip of inspection of offices in northern New York and Vermont.

Mr. Charles Shirley, assistant superintendent of traffic, is spending a vacation at Lake George.

Mr. Thomas E. Fleming, manager contract message bureau, is rusticating in the Catskills.

Mr. H. F. Hawkins, assistant secretary, who has been absent on vacation, is again at his desk.

W. C. Lloyd, Postal Manager at New Orleans.

Mr. W. C. Lloyd, whose recent appointment as manager of the Postal Telegraph-Cable Company at New Orleans, was announced in these columns, records another gratifying instance of progress manifested by the younger element in the telegraph service. Mr. Lloyd has just reached

W. C. LLOYD.
Manager Postal Telegraph-Cable Company, New Orleans, La.

his thirty-sixth year, his date of birth at Bladen Springs, Ala., occurring August 15, 1872. At seventeen years of age, young Lloyd began life as a messenger at Waynesboro, Miss. Acquiring the ability to telegraph, he found employment for a number of years in the railroad service at various points in the South. His first engagement in the commercial service as an operator was with the Western Union Telegraph Company, at Eufaula, Ala., and afterwards at Atlanta, Ga. In 1896 he went with The United Press at Columbus, Ga., but the failure of that concern in the year following resulted in Mr. Lloyd's becoming identified with the Postal at Birmingham,

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Ala., in the employ of which company he has since remained, his career therein being marked with steady advancement. From the position of operator, he was promoted to be chief operator at Vicksburg, Miss., thence being transferred to the Memphis office as all night chief. Then he was sent back to Birmingham to fill the position of night chief, but was soon returned to Memphis as chief operator. His appointment as manager followed, and now further promotion places him at the head of the important New Orleans office. Mr. Lloyd owes his advancement not only to natural ability, enhanced by close application and study, but also to the fidelity he has shown in serving employing interests.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. A. G. Saylor, the assistant general superintendent, who together with his wife and his brother, E. B. Saylor, superintendent at Pittsburg, who, as noted in the August 16 issue, made an extended automobile trip of two weeks, followed an extended itinerary that took them to the Delaware Water Gap, to the Berkshire Hills in Massachusetts, thence northward to the Green Mountains in Vermont, to the White Mountains, across to Portland, Me., the return trip being made by way of Boston, Springfield and Hartford.

Mr. A. R. Brewer, secretary of the company, is finding rest and recreation at New Found Lake, Bristol, N. H.

Mr. W. H. Jackson, who has charge of the leased wire service in the eastern division, spent a recent vacation at his native place in Canada.

RESIGNATIONS AND APPOINTMENTS.

Mr. J. F. Rawie has been appointed manager for this company at Portland, Ore., relieving Mr. William Ingold, who has been assigned to duty as general canvasser for the American District Telegraph Company in the Northwest, with headquarters at Portland. Mr. Ingold will, in addition to his duties as canvasser, also act as inspector for the Western Union Telegraph Company.

Mr. B. S. Jones has been appointed manager at Spokane, Wash., vice R. H. Tucker, resigned.

Mr. George W. Diven has been appointed night manager of the Washington, D. C., office, vice W. H. Young, deceased.

The Cable.

Cable communication was interrupted Aug. 28 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzorote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

Mr. Charles Trippe, superintendent of the Anglo-American Telegraph Company of New York, is in Europe on a three-months vacation. During his absence Fred. H. Nicholls is the acting superintendent.

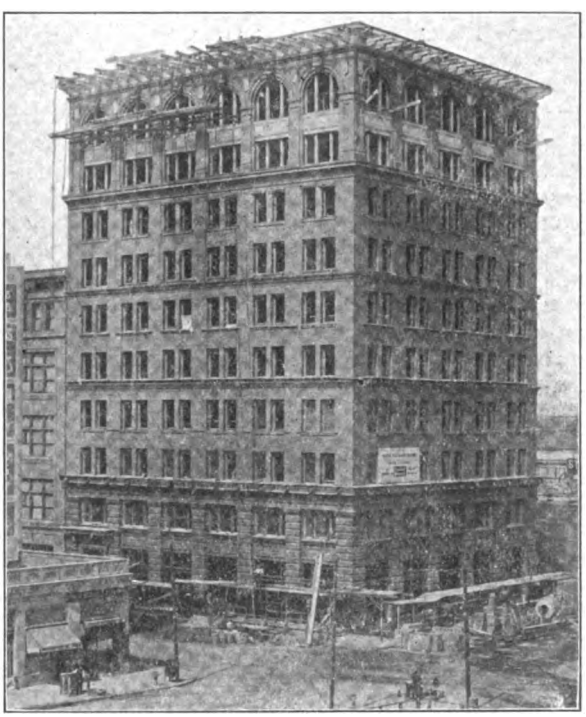
Mr James Nicolson, for many years superintendent of the Western, River Plate and Pacific and European telegraph companies, at Buenos Ayres, Argentina has retired from active telegraph service and returned to England, his native country, where he will in future reside.

A patent No. 895,978 for an apparatus for transmitting and reproducing sounds has been issued to Joseph Arthur Lovel Dearlove, of London, England. Has means by which the water pressure on one side of a diaphragm of submarine transmission is balanced by an equivalent air pressure on the other side.

The Turkish government has issued an official notification to the effect that the Island of Imbros will be connected to the telegraph system of the world by a cable to be laid from Ayia Tonfolia to a place in the Dardanelles, from whence it will be connected by aerial wire with the cable Kilid-ul-Bahr. The new cable will be about 224 kilometers in length. The telegraph office in the island will be at Panazia.

A New Postal Office at San Francisco.

The Postal Telegraph-Cable Company has leased quarters in the new office building at the northeast corner of Bush and Battery streets,



THE POSTAL TELEGRAPH BUILDING, SAN FRANCISCO, NOW NEARING COMPLETION.

San Francisco, for its general offices and operating department. This building, now nearing completion, is being erected by the Crocker Estate. It will be known as the Postal Telegraph Building.

The entire tenth floor will be occupied jointly by the Postal Telegraph-Cable Company and the Commercial Pacific Cable Company for operating rooms, etc. Ten rooms on the ninth floor will

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be used for offices of the various departments, and a portion of the ground floor and basement, together with a mezzanine floor over the ground floor, will be utilized by the Postal company for receiving, delivery, messenger departments, etc.

The new offices are to be modern in every respect, and the various departments will be connected by pneumatic tubes. Work upon the equipment is under way and the new quarters will be occupied before the new year. The work incident to the installation of apparatus is under the direction of H. C. Shaw, division electrical engineer of San Francisco.

Business Notices.

The Kellogg Switchboard and Supply Company have just issued their new bulletin describing in every detail their standard line of common battery apparatus. The bulletin is handsomely illustrated with large well-finished half-tones. The "standard of excellence" Kellogg common battery wall telephones are described in full, with special descriptions of the new Kellogg "short backboard" wall instruments, the new Kellogg "steel hotel set" and the new "indestructible desk stand" which is proving immensely popular.

One of the most unique propositions made to the readers of this publication in recent years is the generous offer of the Hartman Furniture and Carpet Company of Chicago, to furnish homes for the people, no matter how far distant they live, on terms of easy payment, announcement of which is made in another column. This concern is one of the oldest firms in its line in existence, having been started fifty-three years ago. They now have twenty-two stores throughout the United States and are well and favorably known from the Atlantic to the Pacific. This old reliable house fully describe their very liberal method of selling goods on credit, in a big catalogue which they have just issued and which they send free on request. Their address is 223-225-227-229 Wabash avenue, Chicago.

Mr. Frank B. Cook of 252 West Lake street, Chicago, who manufactures the Cook Self-Welding Wire Joint, now so well and favorably known, states that he has had to make continued increase in his manufacturing facilities to take care of the constantly increasing orders for his wire joint. He states that the joint is now being used by many telegraph companies and railroads, in addition to the telephone companies who have used the joint almost since its inception, and some of these companies are using the Cook joint exclusively. He also states that he has found it necessary to increase his range of manufacture to include all sizes in iron and copper from No. 0000 to No. 18. He is also making the copper joint in sizes to accommodate stranded copper cable having a diameter as large as 83,000 C. M. The peculiar construction of the Cook Wire Joint is particularly valuable in all kinds of electrical construction wherein a joint would be used, as it makes an absolutely permanent joint, one which will not deteriorate owing to moisture penetrating and setting up corrosion or high resistance. Mr. Cook will gladly furnish full information and prices upon request.

Radio-Telegraphy.

The Marconi Company's radio-telegraph station at Liverpool, England, was opened for public use on August 1. Telegrams intended for transmission through this station should be addressed like the following example: "Smith, Steamship Carmania, Liverpool Wireless Station."

Mr. Gaston Lacommi, an electrical engineer with a laboratory in Brooklyn, N. Y., is said to have devised a wireless telegraph sending apparatus capable of transmitting four messages at the same time. It is understood that Mr. Lacommi utilizes a transformer giving four different frequencies.

Mr. E. J. Haughton, formerly, and for a number of years with the Canadian Pacific Railway Company's Telegraph and now in charge of the Dominion Government radio-telegraph station at Gonzales Hill, has been appointed superintendent of the whole system on Vancouver Island. At present there are five stations, including the local one, the outside ones being at Point Grey, Cape Lazo, Estvan and Pachena.

It is reported that H. M. S. Indomitable, on her record voyage from Canada, was in wireless communication with the shore all the way, and her messages were received at the Scilly Islands, over a distance of 1,600 miles. By the special request of the Admiralty, the high-power stations at Clifden, in Ireland, and Glace Bay, Canada, belonging to Marconi's Wireless Telegraph Company, Ltd., transmitted the long distance messages to the Indomitable during the voyage.

The Bureau International at Berne makes the statement that the next annex to the Official Nomenclature of Telegraph Offices of the World will also contain a list of coastal wireless stations, as well as those on board ship. The bureau will also issue a special nomenclature of such offices, as most of the adherents to the "Wireless Convention" have furnished them with the necessary particulars as to the wireless stations operating on their territory.

Mr. G. Marconi will soon visit Canada in company with one of the directors of the English board of the Marconi Wireless Company. The inventor is desirous of making further improvements to the wireless service on this side of the Atlantic, and, during his stay in Canada, will spend considerable time at Glace Bay, Nova Scotia, improving the service at that point. It is understood that some definite arrangement will be made regarding a reorganization of the management of the conpany in Canada before Mr. Marconi returns to England.

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Telegraph Age as an Educational Factor.

Mr. S. M. English, general manager of the Postal Telegraph-Cable Company of Texas, at Dallas, Tex., in a circular dated August 15, and issued to all managers, has this to say :

"I attach hereto page 399 from Telegraph Age of July 16, 1908, which contains a very instructive article on mutilation of telegraph signals, which please paste in your book of instructions.

"I desire that you read this carefully and then read it again and as many times as it is necessary to impress upon your mind all the causes of mutilation of telegraph signals, so that you can discuss them freely and correctly with the patrons of the company when explaining errors that may occur in their telegrams. I wish you to also see that your lineman reads this article carefully and understands what causes poor insulation, and the effect of poor insulation upon telegraph signals. It is well worth while of yourself and every employee to read and understand this article thoroughly, and I hope that you will do so.

"I also attach two additional pages from the same issue of Telegraph Age, explaining the duplex and the new Postal intermediate office switch board. The object of enclosing these last articles is to interest you in the study of the apparatus and to let you see why I have always advocated subscribing to Telegraph Age. Similar articles appear in every issue of Telegraph Age, and I do not believe any manager or telegraph employee who is interested in the business, can afford to miss such an opportunity to get an understanding of the wires and apparatus."

The articles referred to by Mr. English as being published by Telegraph Age, he very happily advocates should be read not once alone but many times, until the information contained therein becomes distinct and clear in the mind of the individual. Students of the telegraph, men like J. C. Barclay, Francis W. Jones, William Maver, Jr., the well-known writer, and others, who have arrived at distinction in the profession of the telegraph, because of a clear and practical conception gained of its details, make it the practice of their lives to study and ponder over informing literature concerning this great subject. In this way alone can the mind absorb properly and in logical manner information necessary for its enlightenment and enlargement. Any one who supposes that the full meaning of a technical article or a book can be grasped and retained in the mind by a single reading makes a great mistake. Do not let one reading suffice, make it fifty, and keep the matter where it may readily be referred to. A successful technical man is always an intelligent observer and a close student.

Neutralizing Induction on Telegraph Lines.

A note on a recent British patent of the British Thomson-Houston Company (General Electric Company of this country), says the Electrical World, sets forth the protection of telegraph or telephone conductors which run adjacent to rails used as return conductors on alternating-current railways, from induction, a neutralizing conductor connected in shunt to the rails being placed near the conductor to be protected. This will neutralize the electromagnetic inducion, and since the rails are earthed, will also partly neutralize the electrostatic induction. Resistances may be required in the shunt circuit to reduce the current to the proper amount. For the same purpose a transformer may be used, the primary winding being in series with the rails and the secondary with the neutralizing conductors.

New Canadian Cable Press Service.

The Canadian Parliament has appropriated $24,000 for the purpose of maintaining an independent and efficient service of telegraphic news from Great Britain for publication in the Canadian press.

The appropriation, it is added, is to last until July 1, 1910, and is to be paid to an association or committee representing the proprietors of such newspapers as associate themselves for the purpose of maintaining such service.

Provided, however, that "no payment shall be made under this act until the Minister of Finance has satisfied himself that the benefits of the service are open, on fair and reasonable terms, to all newspapers published in Canada, and that not less than one-half of the cost of maintaining the service is paid by the proprietors of the newspapers participating in the benefits."

The appropriation of $24,000 for maintaining or partly maintaining a new cable news service seems to be entirely inadequate. The Canadians now get a good cable service from The Associated Press for almost nothing and they will find that cable tolls mount up in these days when from $1,000 to $16,000 are spent for single dispatches. —Fourth Estate.

Distributing the News in a Presidential Year.

The work of the general managers of the news agencies, The Associated Press, the Hearst Service and The United Press, is not easy at the best of times, remarks the Fourth Estate, but in the summer and fall of a presidential year it is nerve-racking beyond description.

Melville E. Stone, C. J. Mar and H. B. Clark, respectively, the working heads of the three news collecting and distributing concerns referred to, have their hands full these days. They have not been able to indulge in the much needed relief afforded by a vacation during the hot spell and will not have an easy moment until after election, and even then there will be the "kicks" to be attended to, for no matter how effective a service they may run there always will be some dissatisfied clients.

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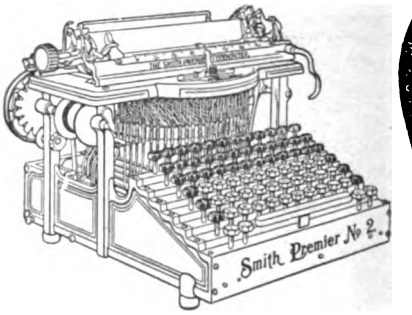

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SEPTEMBER 1, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

A Brighter Dawning.

A study of present conditions in the operating field of commercial telegraphy reveals the gratifying fact that a better state of contentment than has been observed for some time past, among the employed regarded as a whole, is beginning to assert itself. Its further consideration also discloses the existence of a higher morale. It is a satisfaction to record these truths. They are significant in their meaning inasmuch as they may be accepted as indicating a trend toward better things, the full realization of which is of much import, valuable alike to operating forces and to employing interests. This drift points to recovery and stability, and stability is what is needed in order to secure lasting good after recent disturbing influences.

It has been said that the personnel of the telegraph, viewed in its entirety, did not measure up to the standard recorded of a generation and more ago. Whatever of truth there may have been in this assertion, it must be admitted that a readjustment of forces such as has been in process of late, is gradually bringing into clearer perspective a class of telegraphers, whose reassuring impress upon the service in general appears to be becoming more and more evident. This element has power to confer lasting benefits not only upon the telegraph itself, considered as a field of active service, but conversely and with no less force and directness upon its individual constituency. As it presents itself to our view the outlook within the horizon of the telegraph appears as one of better omen; for men who are really faithful to themselves are likewise prone to be faithful to the company that employs them, thus making possible an achievement in results as desirable as it should be obligatory.

The business world never had greater need of intelligent and progressive men than it has to-day. Men so fitted will forge ahead; others will lag behind, for that is but following out a natural law. Although methods of business change, the avenues of employment multiply. Intelligence and capacity command the same recognition in the telegraph as out of it. While the opportunities in commercial telegraphy to secure financial reward may not be so flattering as in some other avocations, it nevertheless does possess many posts of honor and emolument within its gift that are worthy of any ambition and of a keen effort to secure them. They cannot be reached, of course, except by careful preparation and hard work on the part of the individual.

The training that any determined and conscientious man may obtain in the telegraph service, both as an all around electrician and in the development of executive qualities, are obvious. The opportunities afforded him are close at hand and on every side. He can accept or reject them at pleasure. A young man possessed of the right stamina, however, need not be left behind in the race of life, hence it is that we earnestly enjoin, as we have done in the past, that diligent study, broad observation and close application characterize all efforts. It may be that reward will come outside of the jurisdiction of the telegraph, as so many have found it in the past, but wherever and whenever it comes all should be ready to accept it. Remember one thing: the careless and wasted hours of youth will cause many a sigh of regret in later years when plodding existence constitutes the dull routine of life; the student, the possessor of knowledge, the practical man will then have entered upon benefits conferred.

We have noted lately and with especial pleasure, the appointment of numerous young men to positions of responsibility in the telegraph service. While they have been advanced without regard to the law of seniority, it is evident they have won their way because of fitness. In other

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words they have earned promotion and office and we rejoice that they have secured it. Perhaps ultimately they may retire from the position of chief operator, of manager, of superintendent or from whatever place held to step into situations of wider opportunities and larger remuneration, as so many are doing. When they do there should be others qualified and ready to take their places.

We would urge the man at the key to prepare for advancement. He can fit himself in some degree for something better, if he will, while in this initial position. The telegraph has need of his services a round higher up, and is only awaiting evidences of his ability to fill it. At twenty-five a young man may be a first-class operator, and for one of that age may be earning a good salary. But at the key simply he has practically reached his limit. With rare exceptions if he remains an operator until forty, or fifty, or even sixty years of age, his earning capacity is no greater, if as much than at the earlier period. Criticise this fact as we may, and reason as to its apparent injustice, it is the truth. Operators, at the key, as a rule, deteriorate in skill after the freshness and strength of their earlier years is gone. On the other hand a bookkeeper, for instance, a proof-reader, or an author, if you please, and others of like employment, reach a higher degree of skilful attainment and consequent earning power as they grow older.

To suffer retrogration before the time appointed by nature, is to become unnaturally rusty. It is pitiful. Get out of the rut, then, that binds you fast to the key. Have a manly pride regarding yourself and your future and give the law of evolution a chance to work. If you are a good operator to-day, make sure that you will be a better wire chief to-morrow. We would preach optimism. The telegraph is not so uninviting. It may not be a mine of wealth to the individual to whom it gives employment, but the really bright man engaged in it can always draw good pay. The fact should never be lost sight of that the telegraph has graduated some of the most capable business men and brilliant executive officers to be found in this country to-day. This has been its record in the past, it is its record of the present and will continue to be its record in the future.

The Conviction of a Telegraph Embezzler.

The announcement has been made of the conviction of John R. Petrich, for the embezzlement of a sum of nearly $10,250 from the Postal Telegraph-Cable Company at New Orleans. Petrich was employed as chief clerk to the superintendent of the company in the Crescent City, and taking advantage of the opportunities afforded him by his confidential position, at that time vested with even additional security owing to the then recent death of Manager D. W. English, betrayed his trust, stole to obtain funds for gambling, and when concealment of his defalcation was no longer possible, sought escape therefrom by flight. Poor fool! It was the old story. The prayer "lead us not into temptation," should never be absent from the lips, especially of those placed in positions of responsibility. Apprehension of the absconder soon following at Albuquerque, New Mexico, he was speedily returned to New Orleans, and there lodged in jail. On August 14, after a two days' trial, he was declared by a jury guilty of the crime charged. Prior to this theft Petrich, so far as known, had borne an excellent reputation, his honesty at least never having been questioned. At thirty-five years of age, a time when a man should begin to feel that he was beginning to obtain a grasp on the substantialities of life, illumined with a discerning view of future reward, this young man recklessly dashes all to one side, wrecks his own career, brings want upon a wife and three young children and disgrace to his father, who is himself an honored member of the telegraph profession, also at New Orleans.

The brazen effrontery displayed by this criminal in declaring his defense is shown by the astounding argument advanced by one of his attorneys, according to an account in a New Orleans paper, to the effect that the funds taken by the prisoner did not in fact belong to the telegraph company, the claim being made with impudent reasoning that it was money improperly received for tolls on telegrams during the last strike. Verily a fine code of ethics to be ventilated in a court of law!

It is a pitiful scene that depicted between this moral outcast and his family, upon which the curtain now falls. The next act, in which the public unfortunately will lose interest, because lacking in spectacular show, will depict the hard struggle for bread that has been placed upon the little family, to whom the very agony of living is their every day reminder of the tragedy enacted.

No clemency in this case to the evil doer was deserved; none was given, for it was necessary to punish a crime of this character severely. Unfortunately it is not the guilty who usually suffer when they go wrong but rather those who are rendered dependent and helpless by the offense committed.

Mr. A. J. Coppin, of the Western Union Telegraph Company, North Sydney, N. S., takes occasion in a recent letter to say: "Being the only journal devoted to telegraph interests, every telegrapher should be a subscriber to Telegraph Age, and I shall be pleased to recommend it at every opportunity."

The hand never lies. It always obeys without question the orders of its master—the brain. If it is desired to improve the product of the hand, attention must be given to the education of the mind, which has exclusive jurisdiction over the hand.

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The Need of Study and Training in the Telegraph Service.

BY S. M. ENGLISH, OF DALLAS, TEXAS.
General Manager, Postal Telegraph-Cable Company of Texas.

In the retrospect of years, recalling the events of my own life, I wish to bear testimony to the influence for good Telegraph Age has been to me in my chosen occupation. It has ever exerted a beneficent authority and aided me in right thinking and to clearer perceptions of the duties and the inherent opportunities incident to my profession. The instructive articles appearing in its columns have been of invaluable service to me, and were especially so twenty years ago, when as a student I sat up nights in an earnest endeavor to acquire an understanding of my business. Its teachings were practical; they stimulated a young man naturally ambitious, to master the technique of the telegraph. When promotion came to me, and I was made a quadruplex chief, passing in my advance, a number of my seniors who, I remember, often preached that it would be time enough to "learn things" when promotion reached them, the belief became more firmly fixed in my mind that study alone would serve to advance a man. Telegraph Age always resolutely proclaimed this precept. Alas! many of those whom I knew and worked with, side by side, remained in the ranks, although some possessed the natural ability that ought to have caused them to forge ahead. The pity of it is that so many in the telegraph service will not recognize that it is individual unreadiness that frequently keeps them back and down. Too often we hear the argument advanced of "What's the use; I'm going out of the business soon, so there is no need of study." They forget that it is the student only who will obtain advancement, whether in the occupation in which he is engaged, or in the call that may come to him from other avocations.

Impressions obtained in those early days have naturally been confirmed by a broader experience gained in later years. Recently their truth has been brought forcibly to mind. I have had two vacant managerships at the top salary in my territory at my disposal for which I have received many applications, and from some splendid young men, none of whom were qualified to fill the positions because of unfamiliarity with wire testing and apparatus, a fact which calls to mind a recent observation in Telegraph Age regarding the lack of interest displayed by the average young telegraph employe in learning every detail of the business.

Because a man is a first-class operator and a mixer does not qualify him to manage a telegraph office. To successfully fill this post he must know every detail of the business, the management of wires, repeaters and the quadruplex, as well as that of clerical work and the handling of men and messenger boys. He must be firm and just in his treatment of those under him, courteous, accommodating and frank in his dealings with the patrons of the company. It is hardly necessary to say that men possessing all of these qualifications are very hard to find. While it is true that many men are endowed with the requisite personal qualifications, but few have a true and full knowledge of the technique of the business, and who as managers would be competent to relieve any man under them and do his work in a superior manner.

My observation is that too many young men think they are in the business but temporarily, and for this reason conclude it is not worth their while to learn anything more than to send and receive messages, and of that even to do just as little as possible, no more than to enable them to hold their positions. As a rule those who are the least qualified are the hardest kickers when they are not promoted.

It has been my pleasure to have helped a number of young men in their efforts to learn to handle wires and apparatus, and while in numerous instances I have reason to feel proud of the result of such endeavors, there are many whom I have tried to befriend who would not accept my assistance. Then again, I regret to recall a few cases where I have aided in the development of young men of rare abilities who could not stand prosperity and have fallen from grace. None of them, however, are hopeless and I feel sure will ultimately see the folly of their ways and return to correct living and practice and be of value to the company and a credit to themselves, their employers and their families.

Every young man who enters the telegraph business should for his own sake learn all he possibly can about it, even though he really intends to quit at the first favorable opportunity; for no matter what business he may afterwards enter, a thorough telegraph training and knowledge of its details in general will be of incalculable value to him. Any man can learn to know when a wire is open, grounded or crossed, but it is a great satisfaction to know how to measure a wire and definitely locate defects. The use of the galvanometer and other measuring instruments is a very interesting study and will repay any young man for the time he may devote to gaining a practical knowledge of their working.

It is supposed that every operator knows when a quadruplex is "busted," and a great many know how to take a balance and when a main or local current is off, but the really valuable man is the one who is acquainted with the detail and can promptly locate and clear trouble caused by a dirty point, an incorrectly adjusted spring, magnet or armature; a loose connection, a defective condenser, and a thousand and one other little things that get out of gear, any one of which may seem unimportant to the average attendant, but which may seriously cripple a long quadruplex circuit. A good quadruplex man does not wait for these defects to appear, but keeps his appara-

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tus in perfect order by going over it piece by piece every few days to see that it is in good working condition, for in this way he prevents interruptions and consequent delays. The track walker and bridge inspector of the railroad, who sees that every rail is in good condition and every spike and bolt is sound and in place, prevents many wrecks. I have frequently heard the quadruplex condemned, and everybody interested has tried at one time or another to perfect it, but when the conditions under which a large percentage of them are worked daily are taken into consideration, we can well believe that the quadruplex does not need half the improvement that some of those who handle and condemn it do.

A great many men lose an opportunity to learn by pretending to "know it all," instead of listening attentively and asking questions. Information may readily be obtained and there is no excuse in these days for a lack of understanding of wire testing and apparatus. If some chief operators would take a good balance instead of trying to impress upon the man at the other end of a circuit how little he knows about the quadruplex, or waste time discoursing on induction, underground cable interference, etc., they would speedily secure needed results and find their theories exploded. A strange thing to me has always been that a certain quadruplex circuit may work several weeks, and when finally it fails to go because the apparatus has run down and needs attention, that the chief will atribute it to causes which have been experienced by some writer who has had charge of quadruplex circuits paralling a high voltage power circuit or passing through thirty or forty miles of underground. Yet when he cleans and readjusts the apparatus and says, "try it, its pretty shaky but its the best we can get out of it," ten to one the trouble has been removed and the circuit racks along for another two or three weeks before the power circuits interfere again. My instructions to employes handling a quadruplex are to balance up properly the moment there is a complaint. If it is needed, time has been saved, if not, then but a minute or two has been lost. If every quadruplex chief would adopt this plan much valuable time lost might be saved. If there is any defect in a set that cannot be located instantly the set should be thrown out and a good one put in its place without argument, and this can be done at both ends with little loss of time. All spare quadruplex sets should be kept in first class condition and ready for any emergency. Another cause of lost time is in hunting for a file which should always be in the pocket of the man whose duty it is to look after apparatus, but frequently is not. The old famaliar saying of "a stitch in time," etc., is as applicable to quadruplex and repeater apparatus as anything I know of.

"Farmer Brown" of the New York Central.

W. C. Brown, senior vice-president of the New York Central lines, an oldtime telegrapher, who has climbed amazingly near to the top of the ladder of Financial Reward, has turned his private office in the Grand Central station, into a country fair. A canary is the only "live stock" that he has on exhibition at present, but he has the promise of three Spanish mules that W. H. Newman, president of the company, who is now in Spain, threatens to ship to "Farmer W. C. Brown," as Mr. Newman calls him.

Mr. Brown has taken down railroad maps and photographs to make room for samples of Iowa corn and farm scenes. On his desk, under the glass top, Mr. Brown has placed a series of photographs that picture him in the operations of milking cows, carrying the milk, pitching hay and training horses.

Next to railroading Mr. Brown would rather be a farmer and general storekeeper than any thing he knows about. He is all three, for he owns a large general store in Iowa.

While Mr. Brown is the senior vice-president of one of the largest railroads in the country, he has not a dollar invested in railroad stocks. His money is all in farms. Mr. Brown claims to have the long-distance canary singing bird. The other day President Newman sent Mr. Brown a postal card from Spain, picturing three mules pulling a dead bull from a bull ring. "Going to ship 'em over to you," wrote Mr. Newman. Mr. Brown recently bought a cow that was raised on the farm of Queen Alexandra, of England, and he is now busy raising English calves in Iowa, "which is going some," he adds.

There is always a constant demand for books treating on the general subject of electricity from a point of view and in a manner making clear information that the average individual desires to know, but which he frequently finds so difficult to obtain. A volume of this character which is not amateurish in expression, but which, while not designed for experts, is nevertheless valuable to the seeker after knowledge, is prized by those whose opportunities for gaining information on the several branches have been limited. Such a book is "Electricity Made Simple," by Clark Caryl Haskins, the well-known electrical writer. The dedication illustrates the democratic purpose of the author, for it reads, "To my many friends in blouse and overalls, with kindest remembrances." The volume is bound in paper covers, embraces nearly 240 pages, and in its twenty-one chapters, and 108 illustrations, touches upon and illuminates a variety of topics such as are seldom so comprehensively assembled in a single volume. When it is considered that the cost of the book is but fifty cents it will be seen that this low price puts it within the reach of everyone. It will be sent postage paid on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

This is a good time to begin a subscription to Telegraph Age, $2 a year.

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The Military Telegraphers in the Civil War.

PART SEVEN.

From the Fort Scott, Kansas, office of the Western Union Telegraph Company, D. A. Williams wrote under date of November 16, 1878, to Colonel William R. Plum, the historian of the military telegraphers, reciting the part he performed in the military telegraph service during the war of the Rebellion. The story he furnishes is as follows:

"When the war broke out in 1861 I was employed as a telegraph operator by the Hannibal and St. Joseph Railroad Company at Hannibal, Mo. In response to solicitation I joined the 21st Illinois Volunteers at Palmyra, Mo., as an operator. This regiment was under the command of Col. U. S. Grant. We soon moved and established a camp on Salt River, at a point where the rebels had previously burned a bridge.

"Although physically disabled from the army I felt it a duty to do my part, however small, in my country's service, and being the only "sound" operator then within reach, I volunteered without expectation of reward, an act which afforded me as much satisfaction for the simple privilege as anything I ever did in my life.

"Colonel Grant loaned me one of his small tents. Cutting the wire near my tent, I suspended the loop down through the top of the tent. With a small pocket instrument and an empty powder keg for a table, General Grant's first military telegraph office was equipped. We were without chairs, some hay spread on the ground serving for a seat. I had been with Colonel Grant nearly a week until the practical completion of another bridge to replace the one burned, when he informed me that he would pull up stakes and move with 2,500 men at midnight, and would not wake me unless we were attacked, also that he would send for his telegraph tent on the following day.

"Palmyra was a center of rabid rebel sentiment. A meeting was held there at the time of which I write as an expression in furtherance of the secession cause, which brought together a large number of people. Among them was a man from Kentucky with whom I was somewhat acquainted. He was an old-time operator and asked me many questions in regard to my business habits and whether I could read by sound; also, where we kept our main battery as well as other questions regarding the railroad officers. Without wishing to offend him I gave him as little information as possible, but when that meeting took place I found he had put his knowledge of telegraphy to practical use by placing two very fine grounded wires on our line between Palmyra and Hannibal; and in order to conceal them from the train men and repairer, had after attaching them three or four poles apart, tucked them into the cracks of the cedar poles which favored him as they were split from top to bottom. For three days the repairer was hunting for that escape, but in the meantime I succeeded in copying nearly every message from the west by means of a very fine relay, and was enabled by the relay also to locate nearly the precise spot of the escape. I sent a repairer to the pole indicated nearest the battery and sure enough he found the ground wire. Then I sent him back just three or four poles further east and he was astonished to find another. He never would believe, however, that I had not received information from some person as to the location of those "grounds," but the manager of the Palmyra office, since deceased, informed him often that he was sure I could not have seen or heard from the party doing the mischief.

"My next experience was when the wire was cut by the same body of rebel troops, that burned the Salt River bridge. This line of telegraph, while owned by the Hannibal and St. Joseph Railroad Company, was used by the Missouri and Western Telegraph Company, under Charles M. Stebbins, when their wire south of the Missouri River was down, hence it was very important that it should be kept open for both companies. I was requested to go forward and repair the break.

"A train was placed under my control by Col. J. T. K. Hayward, then commanding in North Missouri. Expecting difficulty I took a relay and a coil of wire, but had not tools except such as nature provides every one. I found the break three miles east of Monroe station, at the tank at which point I stopped the train. Looking for a coil of wire, I discovered that the careless baggage man had thrown it off at Palmyra Junction, in order to make room for some trunks. We lacked six feet of wire, and in pulling the sag into position, the wire broke again three or four poles distant from us. The conductor of the train, Count Harris (almost every railroad man knew him), exclaimed almost in despair, "What next!" I said, "All aboard for Monroe and as quick as possible!" Anticipating wire-cutting on the part of the rebels I had a few days previous privately sent to each section man on the entire road a small coil of wire with instructions to secrete it for future emergencies. I found the next section boss at Monroe had saved his wire. This I secured and again returning to the point of breakage, and dismissing the train, succeeded in mending altogether eight breaks. This work completed, I flagged an approaching eastbound train, but the engineer fearing foul play and not recognizing me, did not stop until the fireman shut off the steam and signaled for me to run, which I did I can assure you, the train not stopping, only slowing up so as to be under full control in case the rebels should reach it before I did. One of the officers of the road stood on the rear platform and assisted me to climb aboard. On the day following the tank and the depot at Monroe, at which place I had been at work, together with a train of coaches, was burned by this same band of rebels.

"That same day I started by steamer for St. Louis but on reaching Hannibal was asked if I was willing to go out with several companies to

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act as scouts and to patrol the road. Of course I volunteered. When we reached Monroe once more the place was found to be filled with enemies. I believe every man, woman and child had been sworn to neutrality by the rebels, for we could get no aid or comfort. I commenced at once looking about for a suitable place to establish headquarters. This I did in a two-story hotel. I decided to run a loop in some room of that building but was informed that I would have to take the room forcibly, because the proprietor and all his household had been sworn not to aid us under penalty of death.

"The particular room I selected for my purpose was occupied by two young ladies, who naturally were much incensed at what they termed my 'outrageous and unwarranted intrusion.' As they positively refused to aid us in the removal of their belongings, we gathered up bandboxes, dresses and what not, and deposited them in short order in another room. In this room that night three rebel scouts were tried, searched and found to have concealed weapons and one of them was condemned to be shot at sunset the following night. This room was also the headquarters of Brigadier General John McNeil who joined us with several companies of Merrill's cavalry besides his own regiment. In Merrill's force I found several of my old Michigan friends, one of the captains and nearly one entire company being from my old home.

"Leaving Monroe I went to St. Louis and there entered the military telegraph service for one month under Colonel R. C. Clowry, although still retaining my position with the Hannibal and St. Joseph Railroad Company, to the duties of which I returned after thirty days. Subsequently I entered the military telegraph service regularly in which I remained until the close of the war. Nothing of interest of which I was a party occurred during my stay at St. Louis, except during Price's raid into Missouri. About the time he was nearing the city of Lexington I was assigned to the wire of the Missouri and Western Telegraph Company, which ran through that city and a portion of the way over the Missouri Pacific Railroad. One morning, very early, when I had quite a large accumulation of business on hand, I noticed a stranger on the wire asking for calls of several different points. I called up Kansas City, told him that "there was a colored man in the woodpile," somewhere between us, and that he would soon hear from me with important business via North Missouri, Hannibal and St. Joseph and the north end of the Missouri and Western wire via St. Joseph, the latter point being then the terminus of one division. I had the North Missouri main line (there was only one wire then) joined to the west end of Hannibal and St. Joseph and thus I succeeded in working some very important telegrams from General Pope to Generals Curtis and Ewing, regarding the movements of troops that were then preparing to and which afterwards did cut off the retreat of Price and capture Marmaduke's entire army. While I was sending this business, I remember Colonel Clowry came in the office and finding what I had done to outwit "Johnny Reb" in search of knowledge, looked remarkably well pleased.

"I have since learned how General Price ordered an acquaintance of his to put loops in that wire at Lexington and other points he visited but not to ground the wire. It was well known that this rebel command had operators with them, but, of course, I had not the remotest idea that in fifteen years time I should hear from them again as I have recently.

"The remaining incidents of the war, in which I was assigned to take part, while important in the great chain of events, of which they were a part, contain nothing of graphic interest.

"I wish to be permitted to say that the telegraph operators of the United States Military Telegraph Corps during the War of the Rebellion should have some suitable recognition of their services at the hands of the Government, more than they have had. I trust the day is not far distant, when they will be rewarded either by a grant of land or in some other suitable manner. They bore hardships and privations of camp life, suffered sickness and death, and there has never been so much even as a "thank you" given them by the United States. By their fidelity and nerve the armies were moved, battles were won and property saved. It was through the military telegraph that General Grant said, 'Let us have peace.' This grand sentiment was re-echoed throughout the entire world, but let us remember that it was uttered just after the greatest victory was achieved, where troops vast in numbers, were moved by orders sent through the United States Military Telegraph.

"I have written before of this claim, some five or six years ago, and I hope now the work will not cease until all living and the heirs of all dead of this corps shall receive proper recognition for their services already given to the soldier.

"The grand development of the present system of the Western Union Telegraph Company is greatly due to the necessity of military rule, as enforced in the telegraphic ranks during the rebellion. It was there that system was observed and accepted as an important element in insuring success. The general officers of the Western Union Telegraph Company were also the commanding officers of the telegraph corps and it was through their ability that success was attained. They were practical men then, they are practical men now. The commanding officers, however, never take all glory to themselves. An army of officers would make a poor fight. General Grant gave his men credit under God for their victory. They were allowed bounty, land grants, etc. Our officers in their report also gave us thanks but there the curtain fell and all was dark beyond. Many contracted disease and death in the military telegraph service; many confronted the enemy with no military support and this great republic makes no admission nor grants any award."

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Mr. Edison As a Scientist.

Telegraph Age announced some months ago that Thomas A. Edison, abandoning commercialism, would in future devote himself exclusively to scientific research. This announcement has been received among scientific men in America, England and elsewhere in Europe, with every evidence of approval. According to despatches sent to the New York World a general foreign acclaim goes out to Mr. Edison on his decision, which we quote:

"Edison, a denizen of the scientific Olympus, is above the greeting of mundane workers," says Sir James Dewar, of England, who first liquefied air. "I am most interested to learn of Mr. Edison's resolution and am certain all scientists will welcome his decision," says Marconi. "I sincerely hope he may be spared for a great many years so that science may be further enriched by his splendid genius."

Sir William H. Preece, formerly chief electrician of the English Postal Telegraph Department, said: "I am very glad to hear of Edison's resolve. His acute observation, manipulative skill rapid judgment should help on science, which is very much in dreamland just now."

Sir Robert Ball, the Astronomer Royal, remarks: "All men of science must rejoice that Edison's consummate ingenuity and experimental skill will be devoted to pure science. We earnestly hope many years may be given this brilliant discoverer in which to employ his marvelous powers in extending knowledge."

"I sincerely congratulate Mr. Edison on his new departure," is Hiram Maxim's felicitation. "I only hope that his future discoveries will do as much to advance pure science as they have done in the past to further commercial science."

From Berlin, Professor Slaby, the inventor in wireless telegraphy, a teacher in the Charlottenburg Technical School, said:

"I am greatly surprised by the news about Edison, and will await developments with much interest. It might be a question whether Edison's earlier training has fitted him for the abstruse, more theoretic, purely scientific pursuit he undertakes now. On the other hand, it is entirely possible that, in his long and distinguished career, he has gained more technical and purely scientific knowledge than any 'professor' in the world. I wish the great American, than whom none is greater, a long and distinguished career."

"Whatever Edison does will be done well," said Count Argo, Germany's great electrician. "His work in the evening of his life is certain to be interesting. I did not know he is a chemist or an exact scientist, but it is certain that his contribution to whatever subject he turns his powerful mind will be most valuable."

Professor Antonio Poito, of Florence, director of the physical school there and one of Italy's most distinguished scientists, sends greetings to Edison on his new departure, and says:

"Already Edison has triumphed over difficulties which the most learned philosophers would not have dared to confront."

Bargains in Books—A Few More Left.

In our August 1 issue we offered a choice list of electrical books, standard in character, that had accumulated on our shelves, at the uniform price of twenty-five cents apiece. The books were a little shopworn, but otherwise as good as new. The offering attracted a good deal of attention and a large proportion of the volumes were sold. There are still a few left and any who wish to pick up valuable works at a trifling sum, will do well to give this announcement early attention. If desired, any one of these books will be sent to any address on receipt of the price, carrying charges to be collected. Address in ordering, J. B. Taltavall, Telegraph Age, 253 Broadway, New York. The list includes:

"Telegraphy," by Preece, and three volumes of "Patented Telephony." by Amn. Elec. Eng. Assn.; twenty-one of "Manual of Diagrams," by F. W. Smith; two (board cover) and five (cloth cover) of "Handbook of the Electro-Magnetic Telegraph," by Loring; two of "Gleanings," by Booth; two of "Electro-Plating," by Trevert; one of "How to Become a Competent Motorman," by Livermore; two of "Incandescent Lamp," by Randell; one of "Metric System," by Hartford Steam Boiler Insp.; one of "Arithmachinist," by Goldman; one of "Electric Lighting," by Morton and Anderson; one of "Electric Telegraph," by Sabine; one of "Electricity—100 Years Ago and To-Day," by Houston; one of "Telephone Service," by Webb; one of "Synopsis of Current Electrical Literature," by Osterberg; one of "Evolution of the Electric Incandescent Lamp," by Pope; one of "Laboratory Manual of Electro-Therapeutics," by Herdman and Nagler.

In addition to these electrical books there are one hundred copies of "Lightning Flashes and Electric Dashes," a book of 160 large double column pages, profusely illustrated, made up of bright, ably written stories and sketches, telegraphic and electrical, that should find a place in the home of every telegrapher. This book has sold right along at $1.50 a copy. This bargain price puts them at fifty cents, carrying charges to be collected.

The Monrovia Telegraph Company has been incorporated in Arizona, with a capital stock of $1,000,000, the incorporators named being Simon E. Davis, H. M. Moffat, Frank J. Forbes, Joseph P. Lucy and James P. Seneny.

Mr. E. E. Dildine, of St. Paul, Minn., assistant superintendent of telegraph of the Northern Pacific Railway Company, in renewing his subscription a few days ago, included this paragraph in his letter: "I consider Telegraph Age a valuable asset for the telegraph service."

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Wireless Telegraphy on Foreign Ships.

The English Postmaster-General has issued the following regulations, effective July 1, respecting wireless telegraphy on foreign ships:

1. Definitions.—In these regulations, unless the context otherwise requires, "wireless telegraphy" has the same meaning as in the Wireless Telegraphy Act, 1904. "Naval signaling" means signaling by means of any system of wireless telegraphy between two or more ships of His Majesty's Navy, between ships of His Majesty's Navy and naval stations, or between a ship of His Majesty's Navy or a naval station and any other wireless telegraph station whether on shore or any ship. "Territorial waters" means such part of the sea adjacent to the coast of the British Islands as is deemed by international law to be within the territorial sovereignty of His Majesty, and includes harbors. "Harbor" includes harbors properly so called, whether natural or artificial, estuaries, navigable rivers, piers, jetties and other works in or at which ships can obtain shelter, or ship and unship goods or passengers.

2. Rules to be Observed.—When communications are made by means of wireless telegraphy between a foreign ship in territorial waters and a wireless telegraph station in the British Islands, the rules in force for the working of wireless telegraphy at that station shall be observed.

3. Interference with Naval Signaling or with Other Stations.—All apparatus for wireless telegraphy on board a foreign ship in territorial waters shall be worked in such a way as not to interrupt or interfere with (a) Naval signaling, or (b) the working of any wireless telegraph station lawfully established, installed or worked in the British Islands or the territorial waters abutting on the coast of the British Islands, and in particular the said apparatus shall be so worked as not to interrupt or interfere with the transmission of any messages between wireless telegraph stations established as aforesaid on land and wireless telegraph stations established on ships at sea.

4. Working Apparatus in Harbor.—(1) Except with the special permission in writing of the Postmaster-General no apparatus for wireless telegraphy on board a foreign ship (other than a ship of war) shall be worked or used while such ship is in any harbor in the British Islands. (2) Without prejudice to the operation of the general provisions of these regulations, the use of wireless telegraphy on board a foreign ship of war while in a harbor in the British Islands shall be subject to such rules (whether prohibitive or regulative) as may be made by the Admiralty from time to time.

5. Control of Apparatus on Emergency.—(1) If at any time in the opinion of one of His Majesty's principal Secretaries of State an emergency has arisen in which it is expedient for the public service that His Majesty's Government should have control over the transmission of messages by wireless telegraphy, and notice to that effect is published by the Postmaster-General, after the publication of such notice, and until further notice, the use of wireless telegraphy on board foreign ships while in territorial waters shall be subject to such rules as may be made by the Admiralty from time to time, and such rules may prohibit or regulate such use in all cases or in such cases as may be deemed desirable. (2) Such notice as aforesaid shall be published in the London Gazette, the Edinburgh Gazette and the Dublin Gazette, and in such other manner, if any, as to the Postmaster-General may seem fit.

6. Penalties.—(1) Any person who shall offend against any provision of these regulations, or of any rules made by the Admiralty thereunder, shall be liable on conviction under the Summary Jurisdiction Acts for every such offense to a penalty not exceeding £10, and upon such conviction the court may order that any apparatus for wireless telegraphy installed or worked on board the ship on which the offense was committed shall be seized and forfeited. (2) For the purposes of any proceedings under these regulations the master or person being or appearing to be in command or charge of any foreign ship shall be deemed to have authorized and to be responsible for the use or working of any apparatus on board such ship. (3) Any summons or other documents in any proceedings under these regulations shall be deemed to have been duly served on the person to whom the same is addressed by being left on board the ship on which the offence is charged to have been committed with the person being or appearing to be in command or charge of the ship.

7. Signals of Distress.—These regulations shall not apply to the use of wireless telegraphy for the purpose of making or answering signals of distress.

Book Review.

In "Telephone Law," issued from the press of the McGraw Publishing Company, New York, the author, A. H. McMillan, A.B., LL.B., legal editor of the American Telephone Journal, presents a view from a legal standpoint respecting the organization and operation of telephone companies. The book is intended, as the author remarks, not for practicing lawyers so much as for persons actually engaged in the telephone business. It, therefore, does not attempt to be exhaustive, but seeks rather to place in compact and concise form such legal information as will be of value to the practical telephone man. The author treats his subject comprehensively, however, showing intelligence, industry and careful research in his compilation. The volume, bound in cloth, contains more than 350 pages, is well printed on good paper with wide marginal leaves, and is carefully indexed; price $3. It will be sent to any address on receipt of price, by John B. Taltavall, Telegraph Age, 253 Broadway, New York.

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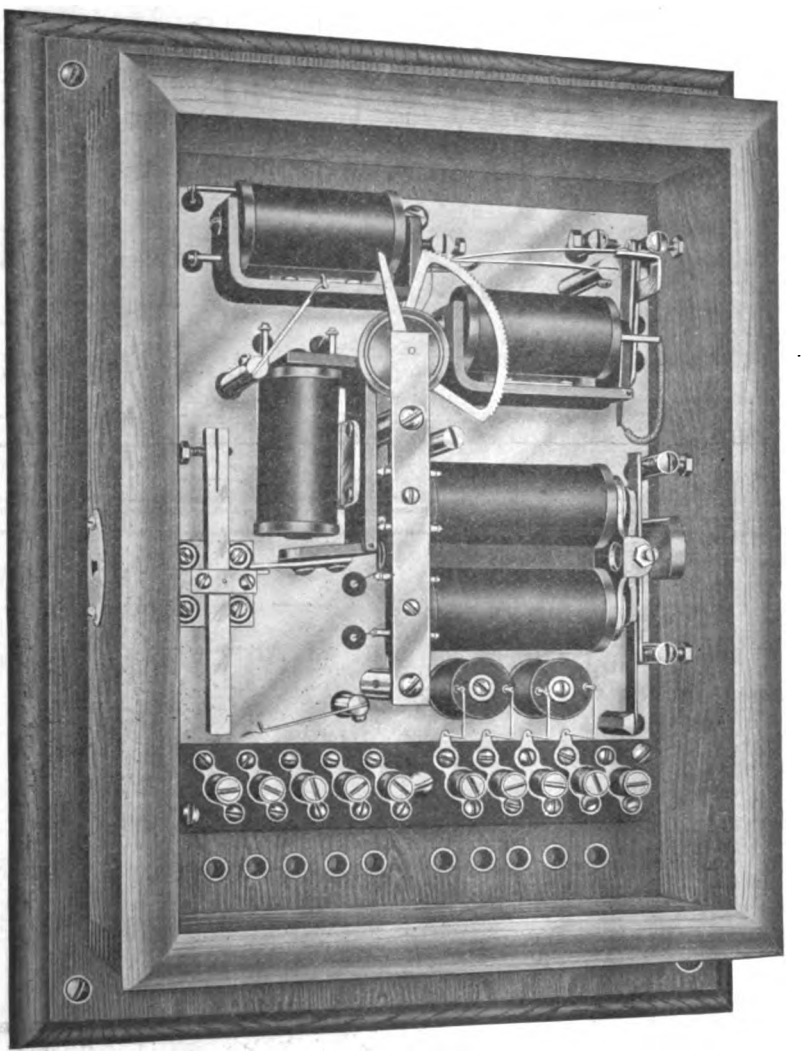
The simplest and most flexible selector on the market. All parts accessible and requires no adjustments. Operates with three cells of battery. Any number of stations may be called, singly, consecutively, or collectively. Can be used on either metallic or telegraph circuits. After practical comparative tests of all devices of like nature one of the largest railroads in the United States has adopted our instrument as a standard.



We furnish complete dispatcher's and sub-station equipments, including telegraphones, telephones and selectors. Our composite apparatus has been in use on some of the largest railroads for several years and continues to give satisfaction. We invite your inspection and will furnish our selectors subject to approval for train dispatching work.

Write us regarding your requirements and we will furnish you all details and estimates.

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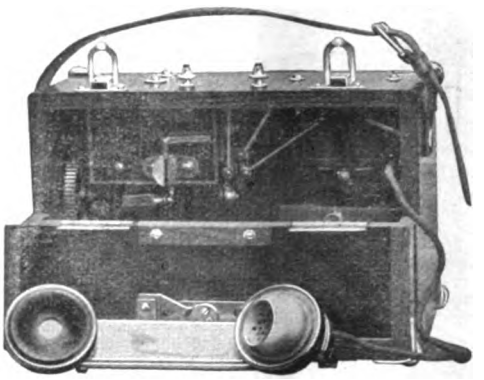

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For Old Time Telegraphers' and Historical Association

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The Railroad.

Mr. E. F. Raymond has been appointed assistant to F. S. Rawlins, superintendent of telegraph of the Southern Pacific Company, with headquarters at San Francisco.

The Georgia Legislature passed a bill recently to regulate the number of hours of telegraph and telephone operators and other persons engaged in the handling of trains, prescribing penalties for violations of said act.

Mr. A. E. Roome, lately resigned as superintendent of telegraph at San Francisco, of the Southern Pacific Company, has been appointed superintendent of telegraph, telephones and signals of the Pacific Electric Railway Company, at Los Angeles, Cal.

A corps of Pennsylvania Railroad engineers and several members of the operating department, have been studying the electrical equipment at New York of the New York Central Railroad with a view of getting data to be used in the final adoption of plans by the Pennsylvania for the electrification of its New York terminal and the tunnels in which the trains will run under the Hudson and East rivers.

The officials of the Richmond, Ind., division of the Pennsylvania Railroad are reported to have said that they have unsuccessfully tried the use of telephones for despatching and do not regard them as good or as reliable as the telegraph. They say it is difficult to hear over the telephone when the weather is bad or when snow and ice accumulate on the wires. They also say that in transmission of messages words are often misunderstood.

The case instituted in Maryland against the Baltimore and Ohio Railroad Company, charged with working several of its telegraph operators nine hours a day in violation of the state law limiting the working hours of such employes to eight hours a day, will probably be dropped. It is understood that lawyers generally who have examined the law on the subject agree that the federal law limiting the working hours of railway telegraphers to nine hours a day supersedes the state law. State's Attorney Waters, of Maryland, inclines to the belief that the state law is void.

A high official of one of the leading railroads when asked what he thought of the substitution of the telephone for the telegraph in the railroad service, replied that the fact that appealed to him the strongest in railroad work was that in the event of an accident, common on large systems, the train crew can communicate direct with the trainmaster, the train despatcher, the superintendent, as well as all other officials who might wish to listen, obviously something that could not be accomplished by the use of the telegraph under like conditions without great delay.

The officials of the Delaware, Lackawanna and Western Railroad Company express themselves as being so well pleased with the operation of the train telephone circuit lately installed between Scranton and Binghamton that it has been decided to equip the Bloomsburg division, eighty miles in length, with the telephone for despatching trains. Chief train despatchers from the Pennsylvania, Reading and Erie roads visited Scranton recently, witnessed the practical operation of the system and pronounced the service perfect in every particular. Mr. T. E. Clarke, general superintendent of the Lakawanna system, a former operator who has risen from the ranks, expressed satisfaction at the working of the telephone service. Mr. L. B. Foley, superintendent of telegraph, under whose direction the work in this particular is being conducted, also expressed pleasure at the satisfactory results thus far obtained.

Reorganized Telegraph and Block Signal Service, Chicago, St. Paul, Minneapolis and Omaha Railway.

In adapting itself to the situation imposed by the Wisconsin eight-hour law and the new federal law, governing the hours of telegraphers who have to do with train orders, the telegraph and signal department of the Chicago, St. Paul, Minneapolis and Omaha Railway has made use of the telephone and has introduced a number of interesting changes in the telegraph service. By the plan in force about every third station is used for a train-order office, and, to some extent, commercial railway and Western Union messages are handled in interlocking towers. The scheme is said to work out very nicely, and the trains can be moved successfully. Thus far, by adapting the telephone to railway service, this company has been able to comply with the nine-hour law without closing any of its offices.

Telephones have been added to the equipment of a large number of offices and the blocking of trains is carried on by the use of the telephone and by telephoners who may be, but are not necessarily, telegraphers. The principal duty of the telephoners is to block trains, but they are required to perform any other work assigned them.

A telegrapher whose duties have no connection with the movement of trains works twelve hours. He is usually the agent and does railroad and commercial telegraphing. A telegrapher or telephoner connected with train movements works nine hours. The thirdtrick man, at offices open continuously, performs train work for six hours, when he is relieved by the first trick man, and then assists the agent during the remaining three hours of his nine hours on duty. Where but one or two telegraphers or telephoners are employed, the station is closed during the least busy period of the day or night. Telephoners are required to pass the same examination as telegraphers, except that they do not have to qualify in telegraphy.

At present the company is not handling train orders by telephone, sufficient telegraph offices being spaced in between the telephone stations for this purpose.

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For these details we are indebted to the kindness of Mr. H. C. Hope, superintendent of telegraph and signals of the Chicago, St. Paul, Minneapolis and Omaha Railway. In commenting on the success of the new system during the three months it has been in effect Mr. Hope says: "Six months ago there were not operators or wires enough to handle the business; to-day we have a surplus of each. The Wisconsin law afforded the railway people—both operator and official—the opportunity of a good education. It is my opinion that inside of two years a large amount of the ordinary telegraphing, including orders for movement of trains, will be handled by telephone. So far we have been successful in maintaining telegraph service at all stations where it existed before the recent restrictive laws went into effect. We do not allow the agent to handle train orders, but want him to meet the general public and take care of their wants as to general railway, telegraph and express business."—Railway and Engineering Review.

Preferably the Telegraph in Train Despatching.

EDITOR TELEGRAPH AGE:

I have read, with great interest, the article in your issue of August 16, "Despatching Trains by Telephone," by Wayne H. Graeff, of Harrisburg, Pa., and would like to state a little instance which happened upon a railroad on which I was employed several years ago.

Among the orders received by a freight train north-bound, reporting at the terminal station, was one stating that a south-bound passenger train would run a certain number of minutes late between two points. The crew of the north-bound train, through an oversight, or possibly thinking that they would have time enough to make the next station beyond before the arrival of the south-bound train, pulled out. The operator at the terminal station did not report at once to the despatcher the departure of the train, (probably due to the fact that the train despatcher was busy issuing train orders and could not break in with his "O. S." report), but the operator at the next station north being a wide-awake fellow and keeping in touch with every movement of trains on that division, heard the north-bound train reported out, possibly ten or fifteen minutes after it had left. He also knew that the south-bound train had passed the next station north several minutes before and should be at his station at that very moment.

Not waiting for the despatcher to call him, he dropped his semaphore signal and rushed out just in time to see the south-bound train rounding a curve but a very few feet ahead, and gave the engineer an additional signal to stop. A minute or two later the freight train arrived. This operator, due to his alertness, had prevented a wreck which, no doubt, would have cost many lives and many dollars. At that place the track was very irregular and it was impossible for an engineer to see more than a few hundred feet ahead of him.

Had this railroad been using the telephone for despatching purposes, the question is, could the despatcher, after discovering the freight crew's blunder, have notified the operator in time to prevent a collision; or, without the tlegraph, do you think the operator would have gained this valuable information? If I am correct, the operators along the line are only supposed to be in on the telephone circuit when called by the despatcher. You may draw your own conclusions.

AN EX-RAILROAD TELEGRAPHER.

Cleveland, O., August 24, 1908.

Train Despatching by Telephone.

A chief despatcher of the Delaware, Lackawanna and Western Railroad Company, in discussing the question of train despatching by telephone, has this to say:

"For the past five or six years there has been considerable discussion concerning the desirability of substituting the telephone for the telegraph in the despatching of trains or steam railroads, but prior to 1907 this subject was principally taken up by parties interested in the telephone business more than by experienced railroad men or train despatchers, and never resulted in anything for several reasons, i. e., a natural prejudice on the part of railroad men grown up in the use of the telegraph—a system so long established that for flexibility it has exceeded anything in the form of telephone that could be expected in a newly installed and untried system, for several years.

"The telegraph in use by all railroads and telegraph companies enables the railroad, in case of interruption to their wires, to borrow wires and by detouring reach the principal points of their road, while by the use of a newly established telephone system, probably limited to one circuit, they would be nearly helpless in trouble of this character.

"Another point which was raised in opposition to the telephone was the prevailing signaling device, which was so objectionable on a heavy party line, such as a despatching circuit would be, as to alone preclude its adoption. This latter objection, however, has recently been removed by the invention of several quick and reliable selector devices.

"Various other minor objections have from time to time been raised, and I might say that the writer was prejudiced against the use of the tlephone for the purpose referred to. But during the last few years something has happened. The scarcity of competent and trustworthy operators has brought the telephone into greater prominence in railroad circles, and has done more to bring about the ultimate supplanting of the telegraph than all other causes combined, hastened, in my opinion, by the mistaken and short-sighted policy of the telegraphers' organizations; and I say this in all sincerity and friendliness, in discouraging the teaching of teleg-

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raphy to those desirous of entering that service, to which policy I also attribute the fact that the general personnel of the telegraph service is at the lowest ebb I have ever known it to be since I engaged in the business thirty-five years ago.

"The scarcity of available operators has also been augmented by the operation of the nine-hour work day as prescribed by Congress, and with everything combined the employing companies have been at their wits' ends to keep this branch of the service in safe and satisfactory operation.

"Mainly for these reasons, the railroads, with a view to self-preservation, began to look around for a solution of a perplexing and worrysome problem, and very naturally first thought of the telephone. As is generally known, several roads have since December last made experimental installations and others have studied the matter and investigated. These experimental installations and investigations have proven so successful that it is almost universally conceded that the telephone is the coming apparatus with which to despatch trains.

"There is nothing so convincing as a practical trial, and it has been demonstrated beyond a doubt that the telephone is a safe and rapid means of communication, and that its advantages are so many as to fully, if not more than, offset the disadvantages before mentioned, and it is confidently predicted that within ten years no large railroad in America will be using the telegraph for moving trains. At least, this is the sincere opinion of one who has been prejudiced in favor of the telegraph and has been reluctant to see a profession in which he has spent his whole life superseded.

"Certain it is that the mileage of roads already equipped with telephone and in successful operation would aggregate thousands, and the system is being extended rapidly.

"In conclusion, I might add that in their exaggerated enthusiasm for the telephone, some writers have brought into the subject matters which really have no special bearing on the practicability of its use in railroad work, and with which I cannot agree; such as the assertion that the train despatcher of to-day is a theorist, who might profitably be superseded by conductors and other employes, as also the statement that telephones never get out of order, but are always in proper adjustment. I am glad to know, however, that these assertions, so far as I am aware, have never been made by any one who has been a practical transportation man. Every railroad man of experience knows that the present telegraph train despatcher is not a theorist, but a practical man, and, as to his judgment concerning matters that come under his control, there is no superior in the railroad service."

Telegraphy in Japan.

The Morse signals used in telegrams written in the Japanese characters are fifty in number, in addition to those representing figures, and the signs of punctuation, etc., says St. Martin's-Le-Grand. These signals are partly composed of those representing the Morse alphabet, and partly of additional combinations of dots and dashes.

Telegraphically speaking, about 3.65 Japanese letters are equivalent to one word in English, which on an average consists of 4.67 Morse letters, and therefore one Japanese Morse signal corresponds to 1.28 international Morse signal. It may be perhaps interesting here to note how Japan is related telegraphically to foreign countries. Of the whole number of foreign messages forwarded or received, and which amount to some 800,000 a year at present, about forty per cent. are credited to Korea, twenty-eight per cent. to China, nine per cent. to England, seven per cent. to the United States, four per cent. to India, three per cent. to Germany, two per cent. to France, two per cent. to Russia, and four per cent. to all other countries.

Book Review.

One of the latest contributions to the closely allied subjects of wireless telegraphy and telephony, and we may say one of the best, is that prepared under the joint authorship of Walter W. Massie, of Providence, R. I., and Charles R. Underhill, of New York, bearing the title of "Wireless Telegraphy and Telephony." Mr. Massie is the inventor of the wireless system, and president of the company, bearing his name. Mr. Underhill is a telegraph expert, and while the inventor of a wireless telegraph printing system is better known as an authority on electro-magnets and solenoids. This little volume of seventy-six pages, which is just off the press, undertakes to deal with and explains the questions now engaging so much attention, in a manner that may be termed "popular." While technecalities have been avoided, in order to bring the presentation within the scope of the non-technical mind, nothing has been sacrificed because of that fact to impair the value of the text. The volume which is illustrated by twenty-seven figures, describes the substance through which signals are sent, the theory of the propagation of waves, method of generating and receiving the waves, the apparatus used, and, finally, the uses, limitations and possibilities of wireless telegraphy viewed both from a commercial and financial standpoint. The book concludes with a statement contributed by Nikola Tesla respecting the future of the "wireless art," as he terms it. This book will be sent to any address on receipt of the price, $1.00. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Mr. C. B. Horton, manager of the Western Union Telegraph Company, Lincoln, Neb., in remitting to cover his subscription for the current year, remarks: "Thanks for renewing my subscription; would not discontinue for double the consideration."

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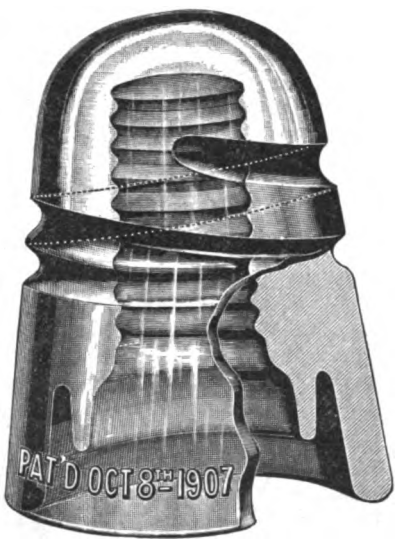
The Barclay Improved Insulator.

The Barclay improved insulator, of which a cut is shown herewith, and which is the invention of J. C. Barclay, the assistant general manager and electrical engineer of the Western Union Telegraph Company, New York, has a spiral groove on its outer surface so threaded that when unscrewed from its pin the tie holding the wire is also unscrewed or removed from the insulator. The reverse operation, of course, screws the insulator on the pin and at the same time puts the



THE BARCLAY INSULATOR.

tie wire back in its original position on the insulator. The object of this insulator is to save labor and expense in renewing glasses when broken or otherwise defective, and in the transfer of wires from one position on a pole to another, all of which is accomplished without untying and re-tying the wire. It is well known that the removal of a tie and the re-tying of the wire to an insulator is not only expensive, but damaging to the wire itself, which, if copper, is certain to be seriously injured in the operation.

This insulator is manufactured by the Brookfield Glass Company, of New York.

The National Electrical Code.

In a paper read before the Canadian Electrical Association by H. F. Strickland, chief electrical inspector of the Canadian Fire Underwriters' Association, he had this to say regarding the formation of the National Electrical Code:

"The National Electrical Code was originally drawn in 1897, as the result of the united efforts of the various insurance, electrical, architectural and allied interests which, through the national conference on standard electrical rules, composed of delegates from various national associations, unanimously voted to recommend it to their respective associations for approval or adoption, and is now presented by the National Board of Fire Underwriters with the various amendments and additions which have been made since that time by them.

"As an evidence of the approval of the National Electrical Code, it might be interesting to know that the following institutions compose the National Conference on Electrical Standards, viz.: American Institute of Architects; American Institute of Electrical Engineers; American Society of Mechanical Engineers; American Institute of Mining Engineers; American Street and Interurban Railway Association; Associated Factory Mutual Fire Insurance Companies; Association of Edison Illuminating Companies; International Association of Municipal Electricians; National Board of Fire Underwriters; National Electric Light Association; National Electrical Contractors' Association; National Electrical Inspectors' Association, and the Underwriters' National Electric Association.

"As a further evidence of the broadness of the National Electrical Code, it would be interesting for many people to know that the amendments which are generally conceded to be advantageous in the code are made at annual conventions held yearly in New York City.

"Some little time previous to each annual convention circulars are sent to the various members calling for sugestions as to proposed changes in the code at the coming convention. These changes are received by the secretary of the Underwriters' Association and are submitted to an electrical committee, who carefully consider each suggestion received. If the suggestion does not warrant any consideration, it is thus reported at the convention. If, on the other hand, they see any value in the suggestion, it is reported also for consideration. Each suggestion, whether approved by the electrical committee or not, is nevertheless mentioned in the proceedings of the convention, and those which have not been fully considered by the committee may even then be discussed by those present if anyone brings the question up. As a rule, however, those suggestions which have not been considered worthy of thought by the electrical committee do not call forth any further discussion. In this way much time is saved and only valuable suggestions are considered.

Mr. Harry Morlan, formerly manager of the Postal Telegraph-Cable Company, at Kansas City, Mo., and who now is in the wholesale postcard business at Dallas, Tex., in renewing his subscription, writes: "Although I have left the telegraph service I could not do without Telegraph Age, which I have read for fifteen years and hope always to remain a subscriber."

Every telegrapher who loves his profession, who is determined to master its technicalities, and thus insure for himself the confidence and respect of his official superiors and place himself in the direct line of promotion, should subscribe for and become a careful reader of Telegraph Age.

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Wigwagging Before the Telegraph.

During the demolition of the old Custom House in Wall street, New York, several old flags were found underneath the flooring of the upper story. The supposition was that they had been used for the announcement of the arrival of certain ships. It was ascertained that these long hidden flags had been used for a number of years before the electric telegraph line was built between Jersey City and Philadelphia, in 1845, in wigwagging stock market quotations and numbers drawn in lotteries between New York and Philadelphia. From the roof of the old Custom House, then the Merchants' Exchange, a flagman signaled to a man on Bergen Hill, N. J., who in turn signaled to a man six miles away, and so on, to Third and Market streets, Philadelphia. This flag signal service communicated a ten-word message in about two hours on days free from fog or snow storms. At times the service was supplemented by a lantern method of communication.

When the Morse telegraph line came into use between Philadelphia and Jersey City, for a time the messages between New York City and Jersey City were wig-wagged between the telegraph offices. Thereafter a line was built along the Jersey shore of the Hudson River a few miles northward, to reach a narrow part of the river, where a wire was stretched over and thence continued to New York City, making a circuit of about thirty miles, because it was not believed that a submarine cable was practicable, although S. F. B. Morse and Alfred Vail had made successful experiments with a submerged line of electric telegraph to Governor's Island, New York harbor, some time before the line was built between Washington and Baltimore.—Chicago Popular Electricity.

The Telegraph in New Zealand.

The telegraphic system of New Zealand increased by 1,633 kilometers of line and 5,380 kilometers of wire during the year 1906-7, and attained a development of 14,415 kilometers of line, and 43,520 kilometers of wire, while the number of offices increased from 1,200 to 1,447. The system dealt with 6,160,080 private and press telegrams, and 236,252 Government telegrams, making a total of 6,396,332 telegrams, an increase over the previous year of 756, 113. The average per person for telegrams sent, is 6.84. The Pacific cable took 25,280 ordinary and 36 press telegrams to Australia, a total of 25,316, while the Eastern Extension Cable Company handled 3,431 ordinary, and 153 press, or a total of 3,584 telegrams. It will thus be seen that the collections of the Pacific Cable of traffic for Australia exceed the Eastern very largely. As regards traffic from New Zealand to other countries than Australia, it is found that while the Pacific cable handled 68,919 ordinary, and 632 press telegrams, the Eastern Extension Cable Company handled only 8,091 ordinary, and 994 press telegrams; the total collections on all traffic originating in New Zealand are 94,867 by the Pacific, and 12,669 by the Eastern company, thus showing that the Pacific cable has a strong hold in New Zealand. The cable traffic for the year 1906-7 exceeded the previous year's figures by 14,043. Ordinary traffic to New Zealand increased from 81,717 to 95,568 telegrams, of which 67,216 were carried by the Pacific cable and 28,352 by the Eastern Extension Company, so that even here the Pacific cable captures about 66 per cent. of the traffic.

Nature of Charges of Positive Electricity and the Existence of Positive Electrons.

We know, says Jean Becquerel in an article in "Comptes Rendus," that the charged radiations of negative electricity (cathode rays, B-rays) are formed by a flux of corpuscles called electrons, whose mass, 2,000 times smaller than that of the hydrogen atom, appears to be of an electromagnetic nature, and which may be regarded as intermediary between the ether and ponderable matter. On the other hand, the actually known positive radiations (a-rays, canal rays, anode rays) are constituted, not by electrons comparable to the negative particles, but by ions possessing a mass at least equal to the material atom of hydrogen.

The existence of positive electrons appears hardly to be admitted at present. Many physicists think that the positive charges of atoms result from a lack of negative electrons, and do not accept a second constituent of matter. Yet some physicists, finding difficulties in the way of accounting for the properties of metals by means of negative electrons only, have introduced the hypothesis of positive electrons, although hitherto no fact has revealed their real existence. The absolute lack of data on this important question at present retards the progress of our knowledge of the constitution of matter. The study of magneto-optic phenomena in the rare earths, pursued for two years along the whole scale of temperature, furnished, for the first time an experimental basis for the hypothesis of positive electrons.

Among a number of books on the market treating of the general subject of train despatching, that bearing the generic title of "The Train Dispatcher," written by A. W. Early, a train despatcher himself, has gained a wide popularity, its value being based on the fact that it is one of the best books of the kind ever produced. It supplies a certain practical information of a class desired by the ambitious worker as a guide and inspiration to him in his daily work. Its 104 well printed pages are packed full of educatory matter, and the volume should be, as it has been, a welcome possession to every telegraph operator and train despatcher in the railway service. This book will be sent to any address on receipt of price, $1.00. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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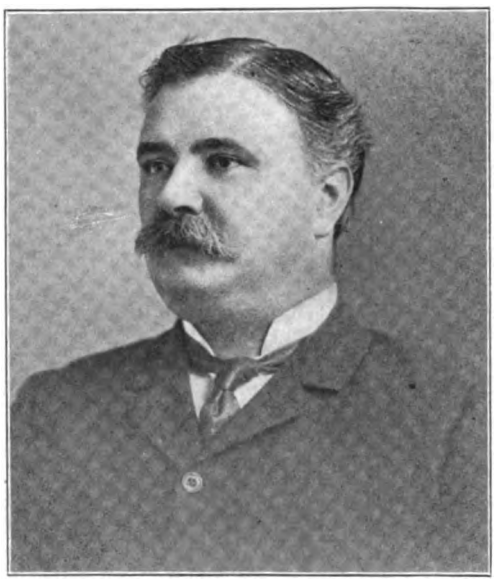
Death of John Brant.

John Brant, one of the best known telegraphers in New York, and for many years the secretary of the Old Time Telegraphers' and Historical Association, died after a prolonged illness covering a period of several years, at his home in Brooklyn, 892 Greene avenue, on the morning of Wednesday, August 26. Funeral services were held at his late residence on Thursday evening, August 27, a large number of telegraphers, former associates, and other friends, being present. Rev.



THE LATE JOHN BRANT.

Amos Judson Bailey, formerly a telegrapher at Cedar Rapids, Ia., delivered an eloquent and touching eulogy on the life and character of the deceased. Mr. E. F. Howell, an old friend, secretary of the Serial Building Loan and Savings Association, also delivered a short address.

The death of Mr. Brant, although not unexpected, nevertheless came as a distinct shock to many, and his passing away has occasioned a feeling of profound regret in local telegraph circles and among telegraphers the country over, for wherever known he was held in high esteem. He was a man who attracted others to himself because of an affable manner; as a friend he was loyal. Strict integrity and uprightness marked all of his dealings. His character was above reproach. As secretary of the Old Time Telegraphers' and Historical Association, he was an intelligent, indefatigable and conscientious worker, contributing freely of his time to promote the welfare of that organization and of its individual membership. This was shown in many ways and in none more strikingly than his ability, because of wide acquaintance, to procure in former years, railroad transportation for members who desired to attend the annual reunions of the association, although such service was attended frequently with infinite labor. His tall, robust form and cheery friendliness will be missed at [illegible] conventions, as his absence of late years was deplored because of his inability to attend incident to growing weakness.

John Brant was a native of Salisbury, Litchfield County, Conn., where he was born December 17, 1848. He became identified with the telegraph when sixteen years of age at Dover Plains, N. Y. Subsequently he was stationed for two years at Pawling, N. Y., going thence to White Plains, N. Y., where he held the dual position of railroad station agent and operator. After three years spent at that point Mr. Brant came to New York, and on March 29, 1870, entered the service of the Western Union Telegraph Company, the main office of which was then located at 145 Broadway. His first and only assignment was to the Bridgeport, Conn., circuit, a wire he worked continuously until failing health compelled his retirement. Mr. Brant was a member of the Telegraphers' Mutual Benefit Association, The New York Telegraphers' Aid Society, the Magnetic Club, and other telegraphic associations. He was married in 1891 to Miss Lena J. Allen, herself a former telegrapher, who survives him.

Obituary Notes.

George W. Jaggers, a telegraph operator, twenty-six years of age, because of despondency due to ill health, committed suicide at Kansas City, Kan., on August 10.

Dr. W. M. Habirshaw, president of the Habirshaw Wire Company, New York, died of apoplexy at his summer home at Saratoga, N. Y. on August 16, at the age of seventy- four years. Dr. Habirshaw was an expert in insulation and was widely known in telegraph and electrical circles.

Fred. B. Holcomb, aged forty-five years, one of the oldest telegraphers at Watertown, N. Y, in point of service, died of consumption in that city August 2, after an illness of about two years. Mr. Holcomb had for about twenty years held a position in the Western Union telegraph office in Watertown, and had remained at his work there until April 14, when he was compelled to forsake his key for his bed. Mr. Holcomb during the entire time of this period of service was the agent of Telegraph Age.

Concrete Poles in England.

A Swiss invention for making hollow concrete poles for telegraphic, telephonic and power-transmission purposes is now being worked in England. In making these poles the concrete, which is mixed very dry, is applied around a core of sheet-iron and a pressure of 5,000 pounds applied. The system of manufacture involves the use of a conveyor belt and webbing which, while applying the pressure named to the concrete, at the same time embeds longitudinally wire rods into it, after which wire is wound around the outside spirally. Such reinforced poles are said to have been used to a large extent upon the Continent, and the prices quoted under the new system are some sixty per cent. cheaper than the ordinary poles which have been used hitherto.

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Convention of the International Association of Municipal Electricians.

The International Association of Municipal Electricians held their thirteenth annual convention at Detroit, Mich., August 19, 20 and 21. There was a fair attendance, greeting to which was extended by R. A. Smith, of Norfolk, Va., president of the association. Mayor William B. Thompson was introduced to the electricians who welcomed their coming to Detroit with earnest and well considered remarks. He applauded the wisdom that prompted the organization of the electricians, recognizing the importance of the annual meetings which brought so many intelligent men together from the chief centers of population to compare methods and discuss the welfare of their respective cities, and of municipalities in general, so far as electrical interests of which the delegates were representative, were concerned.

J. B. YEAKLE, BALTIMORE. MD.
President, Association of Municipal Electricians.

A large amount of routine business was dispatched on the first day and papers on "Modern Police Signal System" and "Testing for and Locating Faults in Electrical Systems" were read and discussed, in which President Smith took an active part.

Papers and discussion on the themes introduced occupied most of the second day proceedings. Jerry Murphy, superintendent of police telegraph of Cleveland, presented the question of "Modern Police Signals," in an admirable paper, Clarance R. George, of Houston, Tex., being one of the prominent speakers in its discussion.

The "question box," so called, the depository of questions accumulated through the year of queries calling for reply at the convention, and which in a number of instances were provocative of remark leading to discussion, was as usual an interesting feature of the meeting.

The papers read others than those mentioned were: "Combination Cables for Fire and Police Signal Systems; "Moving Picture Hazard"; "Batteries for Signaling Systems," and "Electrical Equipment of a Fire Station," all of which were productive of much interested discussion.

The election of officers was held on the morning of the last day of the convention, vice-president J. B. Yeakle, of Baltimore, being elected to the presidency; W. S. Devlin, of New Castle, Pa., was made first vice-president; H. C. Bundy, of Watertown, N. Y., second vice-president; F. A. Cambridge, of Winnipeg, Man., third vice-president; C. R. George, of Houston Tex., fourth vice-president, while Frank P. Foster, of Corning, N. Y., was re-elected secretary and C. E. Diehl, of Harrisburg, Pa., treasurer. Among the department committees named was that of the police signal consisting of Messrs A. C. Farrand, Jerry Murphy, and A. L. Kittridge; and that of the fire telegraph, which included C. F. Gall, S. W. Manning and H. C. Bundy. It was voted to hold the convention of 1909 at Atlantic City, N. J. The social features of the occasion offered an attractive programme which were entered into with zest and which were much enjoyed, the concluding function after a luncheon at Belle Isle being a most delightful boat ride.

There were numerous exhibits on view of electrical devices for which space had been reserved in the convention hall.

Municipal Electricians.

Chief Operator Andrew Martin, in charge of the fire alarm telegraph bureau of the fire department, New York, is busily engaged in formulating plans for the installation of the new fire alarm telegraph system that will be put in service as soon as the annex to the fire headquarters building is completed. The whole of the top floor of the old and new buildings will then be used exclusively for the fire alarm service, which at present is very short of space for the amount of business that has to be done. The rapid growth of the city the past decade has rendered it absolutely necessary that the fire alarm system be brought up to date. The battery room is overcrowded and one-half the space of the telephone operator's quarters is taken up with batteries. When the battery room is transferred to the annex, the telegraph operating room will be extended to include the space now taken up by the batteries. The instrument- maker's room will also be in the annex and the space now occupied by this branch of the service will be added to the telephone operating department. The telephone operators are very much cramped for space at present, and the proposed changes will be welcomed by the operators, as the noise of the instrument-maker's lathes interferes with the successful and efficient operation of the telephone.

Michael R. Brennan, who had been in the Police Department, New York, thirty years and for the last fifteen years superintendent of the telegraph and electrical service, was retired on August 3 by Commissioner Bingham.

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LETTERS FROM OUR AGENTS.

It will be noticed that a number of agents have responded to the request made in this column by sending notes from several different points We were pleased to receive the information which these contributions convey, and we hope for a larger response for publication in the next issue. One writer, however, wrote in rather a grim mood to the effect that there were absolutely no changes in his office since the hard times set in, that no one would resign and that no one would die, all holding on to what they had apparently with a firm purpose to "see the thing out." All we can say is that this expressed determination is in accordance with eminent good sense.

The current information of any office will, if carefully chronicled, furnish a welcome digest of news that will be read with pleasure and satisfaction by thousands, and this limit should constitute the legitimate contents of all letters. And we wish that our correspondents would avoid the too frequent habit, at all times a bad one, of abbreviating words in writing. This is a peculiarity among telegraphers, we know, but what may be plain to the writer, and for local interpretation, is usually a mystery to the editor, and is apt to lead to an error in the printed statement.

CHICAGO, WESTERN UNION.

Those from this office who were assigned to duty at Denver at the time of the Democratic convention, appear not only to have enjoyed themselves at the Colorado city, but to have performed work that has called forth much favorable mention. An instance of this is shown in a letter from Superintendent F. H. Tubbs addressed to chief operator A. B. Cowan in which the Chicago office is highly complimented on the good work of the men who were sent to Denver, a recognition that has been much appreciated.

Business is holding up very well at present and the men are making some better time than they did in the early summer.

L. N. Thompson, assistant wire chief, has accepted a position as wire chief on the new extension of the Chicago, Milwaukee and St. Paul Railroad. His place on the West board has been taken by S. H. Nolly.

R. D. Welch of the east switchboard has resigned to accept a position with a brokerage firm in his home town of Des Moines, Ia. He is succeeded by R. O. Burke of the night force.

C. H. Kruse, who was badly burned in a railroad wreck near Arkadelphia, Ark., last December, has recovered and is now employed in this office.

Charles White, formerly division chief in this office, but now located in Oklahoma City, Okla., was a recent visitor.

J. J. McCormick(of the Barclay printer, is ill with pneumonia.

Among those who have resumed their places after a vacation are: C. H. Finley, F. H. Gournee, F. T. Thomas and J. F. Costello.

PITTSBURG, POSTAL.

The fine new office here continues to win golden opinions from all who are in any way associated with it. The appointments of the operating room are such that in the matter of ventilation, of abundant space, of light and in up-to-date equipment, it offers especial attractions to the operator. When to these conditions is added the fact that the people here are agreeable to work for and among, the desirability of the Pittsburg environment may be judged.

There has been a constant going and coming among vacationists. Among those who have been away and are now back at their accustomed places are: F. L. Bender, wire chief; W. M. Munson, traffic chief, and Mrs. Margaret Hammond, city chief.

Those who are absent include: George W. Dull, wire chief, and George O. Morse, repeater chief.

Miss Ruby Barnes is relieving at Warren, Pa., and locally Miss Emma Sellers and Mr. Wallace are relieving at branch offices, while Miss Anna McCauley is stationed at the National Tube Company, and Mr. McMillen at the office of Darr, Luke and Moore.

PHILADELPHIA, WESTERN UNION.

Mr. C. B. Wood sailed for Europe August 25, to be absent on a vacation that will cover six weeks.

Other absentees are: D. Good, John McCoy, Miss Arthur, Miss Bessie Sacks, Miss Fannie Schott, Miss Ormeston, Miss Helen Ober, and Miss Anna M. Tiernan.

Among those who have returned from their vacations are: Charles Unruh, John McCarthy, Dennis Burns, and Harry Wobensmith, chief clerk.

ST. LOUIS WESTERN UNION.

A Barclay printing circuit is to be established between this and the Nashville office.

Superintendent George J. Frankel announces the transfer of Miss Mary Burke as manager from Van Buren, Ark. to Fayettevillle, Ark.

Vacation time has its votaries in the telegraph forces in St. Louis as well as elsewhere. Hence it is that George A. Riber, quadruplex chief, is away, leaving his position to be filled temporarily by W. J. Armstrong; J. H. McHugh, stock operator, is finding recreation in Buffalo,, while Miss Nell Ruhlman, force clerk, is visiting at Youngstown, O.

George Harrigan, former division chief, is back from a trip to New York; also Miss Martha Russell, who has been absent at Holden, Mo.

During the recent Democratic convention at Denver the St. Louis Wheatstone department did splendid work. Miss B. Guidra was at the receiver, being relieved occasionally by Miss Mary Tynan and Mrs. W. H. Denwiddie, all of whom are Wheatstone experts. Among the expert tape senders were R. E. Norman, Henry Horstman, Mrs. F. S. Spencer, Misses Rose Berg, Nellie

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Frazier, Agnes Tobin, Eva McEnery, Mamie McLaughlin and Lou McEnery.

New York Items.

Mr. J. H. Russell, a former telegrapher, now holding the position of district plant chief of the American Telephone and Telegraph Company at Maumee, O., recently visited New York, finding a welcome among numerous telegraph friends.

Mr. Sanford M. Fones, an old-time telegrapher, and now district plant chief of the American Telephone and Telegraph Company, at Syracuse, N. Y., was in New York a few days ago, when he took occasion to call upon a number of old telegraph friends.

Mr. E. J. Wehrley, special agent of the American Telephone and Telegraph Company, New York, a well-known former telegrapher, spent a very delightful vacation recently in Boston, making that city the "hub" of numerous radiating excursions.

The Man Who Cheats His Work.

An employer of thousands of men was asked what thing in all his large operations gave him the most concern, remarks the Saturday Evening Post. "The man who does a little less than is expected of him," was the reply. "He is the dangerous factor in all business. The absolute failure we readily discover and discharge, but the 'almosts' escape detection for months and often for years, and they make our losses as well as our fears," and with a very serious smile he added, "The drip in business is worse than the leak."

It is a condition that is as old as human experience. Eighteen and a half centuries ago Seneca put it in these words : "Some portion of our time is taken from us by force; another portion is stolen from us ; another slips away. But the most disgraceful loss is that which arises from our own negligence ; and if thou wilt seriously observe, thou shalt perceive that a great part of life flits from those who do evil, a greater from those who do nothing, and the whole from those who do not accomplish the business which they think they are doing."

Thousands of men fancy they are fulfilling their duty to their employers and to their tasks by keeping hours and performing just enough to hold on to their positions. They have an idea that to do more wold be to give larger service than their compensation required. They object to what they believe would be extra value. "The old man shan't get more than he's paying for," is the vernacular.

Possibly it never strikes these trimmers that in cheating their work they are doing double damage; they are injuring their employers much, but they are robbing themselves more; they are, in fact, losing everything in life that is worth while. They fare worse than if they did nothing at all, for time with all its precious values slips entirely from them and leaves no substance or satisfaction.

Half doing soon brings undoing. It is the nine-tenths doing or the ninety-nine one-hundredths doing that bleeds business and saps character.

The Reunion of the Old Time and Military Telegraphers.

As the time approaches for the reunion of the Old Time Telegraphers' and Historical Association and the Society of United States Military Telegraph Corps, at Niagara Falls, on September 16, 17 and 18, interest in the affair appears to be on the increase. The military telegraphers, especially, expect a large and representative attendance of its membership, which will include such men as Colonel Robert C. Clowry, Colonel William B. Wilson, Charles A. Tinker, Colonel Albert B. Chandler, David Homer Bates, and Colonel William R. Plum. It is hoped that the occasion will serve to bring together a greater number of the military telegraphers than have assembled at these gatherings in late years. As an attractive programme of entertainment has been provided to cover the three days of the meeting, which will include a banquet at the Cataract and International Hotels on the evening of Thursday, September 17, a fine time is distinctively in prospect.

On the evening of August 27 a dinner was given at the Press Club, Chicago, by Messrs. William R. Plum, J. E. Pettit, A. H. Bliss, A. W. Nohe and J. R. Dixon to their comrades of the military telegraph residing in the vicinity of Chicago, the object of the affair being to talk over the coming reunion at Niagara Falls, and to devise means to secure as large an attendance as possible from the West.

The recent death of John Brant, the secretary of the Old Time Telegraphers' and Historical Association, was profoundly regretted, for he had endeared himself to all of his associates in the dual associations to an unusual degree. The issues of Telegraph Age of September 16 and October 1. will be largely devoted to a full chronicling of the reunion and of its eventful happenings.

One of the best advertised telegraphers in the United States is Frank N. Roberts, chief operator of the Postal Telegraph-Cable Company at Chicago. This distinction has been thrust upon him by the perversity of a slug of type appearing under the picture of Mr. Roberts in the August 16 issue of Telegraph Age, which accredited that gentleman to the Western Union service rather than to that of the Postal, and which successfully resisted removal although a corrected slug was prepared and ready to take the place of the faulty line. It is asked, "Can such things be?" Yes, Alas! sometimes in a printing office. And an error looks very glaring when appearing in cold type.

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Commercial Cable Employes' Outing.

The employes of the Commercial Cable Company had their first outing on August 16, an event which hereafter is to be an annual affair. The meeting was at New Dorp, Staten Island. The weather was all that could be desired and a large crowd of friends and competitors witnessed some excellent performances. Prizes to the value of $500 had been presented by Clarence H. Mackay, president of the Commercial Cable Company, and valuable prizes were offered for each event. The swimming contests, which were evenly contested and produced some very close finishes, occupied the morning programme.

Lunch was served at Lange's Athletic Pavilion, after which the main events were commenced.

These concluded, dinner was served at E. Hett's Hotel, one hundred and fifty persons being present. The prizes were presented by S. F. Austin, the assistant superintendent of the New York office, and each winner was the recipient of a hearty round of applause on receipt of his prize.

Much of the success which attended the meeting was due in a great measure to the efficient manner in which the programme was handled by J. J. McHugh, the official starter of the Amateur Athletic Association.

The Royal (Visible) Typewriter. Irrespective of price ($65.00). Absolutely the best typewriter for message, press or railroad work. Easy monthly payments. Rental three dollars monthly. Old style "blind" machines taken in exchange. Booklet on request. Address personally D. A. Mahoney, care Roval Typewriter Company, New York City.

Telegraphers' Mutual Benefit Association.

Assessment No. 482 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of Miller Hawk, at El Paso, Tex.; John C. Witt, at Houston, Tex.; Robert Yates, at Rockaway, N. Y., and Thomas T. Rabbitt, at Washington, D. C.

Mr. N. R. Young, has been appointed agent for the Telegraphers' Mutual Benefit Association at Washington, D. C., to succeed Mr. W. H. Young, lately deceased.

Learn stenography in your spare hours. Operators make good stenographers. I can teach you by mail at your homes—distance no obstacle. Terms so reasonable that all can afford to learn. Write for particulars. Eugene Davis, LL.B., law and legislative reporter, formerly reporter of debates, United States Senate for The Associated Press. Address Box 22, Madison Square Station, New York City.

The Atlantic Telegraph Company, of which Robert Morton is general manager, has recently removed its headquarters from Lowell, Mass. to 61 Hanover Street, Boston.

Notice.

Advertisers who use this special want column obtain excellent results therefrom. Frequently when expert help is required in any branch of the telegraph or allied services, as a rule the very best men available have been secured through the medium of this department. This has been so uniformly the outcome as alike to satisfy advertisers and please the publisher. Replies to advertisements coming as they do from all parts of the country, prove that these short, pithy advertisements catch the eye of thousands of readers.

A saving man comes out ahead. The Serial Building Loan and Savings Institution, 195 Broadway, New York, long established, not only affords absolute safety for the depositor, but pays him five per cent. for his money, helps him to acquire a home when desired, making the conditions of payment unusually easy and attractive. Correspondence is desired.

Advertising will be accepted to appear in this column at the rate of twenty-five cents a line, estimating eight words to the line.

Rebuilt number six Fay-Sholes; also number six Remington, both in good condition; fifteen dollars each; be quick; address "Typewriter", care Telegraph Age.

WANTED.—Information as to whereabouts of Operator E. J. Hamilton. Address "S," care Telegraph Age, New York.

Will buy or sell, in one to ten-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

To-morrow spells failure. Do it to-day.

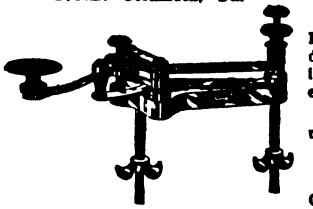
Rubber Telegraph Key Knobs.

No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

Leg Pattern $3.50
Legless Pattern 4.00
F.O.B. Columbia, Pa.

THE LEFLEY KEY.



The Best Key on the Market for Business and Profit. Because it does not stick; is durable; speedy; insures fine clear-cut Morse; an easy sender.

Send draft, express or P. O. money order.

S. B. LEFLEY,

Columbia, Pa. R. F. D. No. 1.

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The Postal Telegraph-Cable Company of Texas.

Executive Offices, Dallas, Tex.
S. M. ENGLISH, General Manager.

Operates west of the Mississippi River in Southern Missouri and Kansas, Arkansas, Oklahoma and Indian Territories, Texas and Louisiana, with outlets at New Orleans, La.; Memphis, Tenn.; Vicksburg, Miss., and Wichita, Kan., at which points it exchanges business with the

POSTAL TELEGRAPH-CABLE COMPANY
CANADIAN PACIFIC RAILWAY COMPANY

COMMERCIAL
ATLANTIC — CUBA — PACIFIC
CABLES

HALIFAX AND BERMUDAS AND DIRECT WEST INDIA CABLES
UNITED STATES AND HAYTI CABLE
BRITISH PACIFIC CABLE
ALASKA CABLES
DOMINION GOVERNMENT LINES TO THE YUKON
NEWFOUNDLAND GOVT. SYSTEM

The Great North Western Telegraph Company of Canada

H. P. DWIGHT, President. I. McMICHAEL, Vice-Pres. and Genl. Mgr.

Head Office: TORONTO

DIRECT WIRES TO ALL PRINCIPAL POINTS

EXCLUSIVE CONNECTION IN THE UNITED STATES WITH THE WESTERN UNION TELEGRAPH COMPANY.

DIRECT CONNECTION WITH THREE ATLANTIC CABLE STATIONS.

The Great North Western Telegraph Company has a larger number of exclusive offices than any other telegraph company in Canada, and its lines reach 49,280 offices in Canada, United States and Mexico.

DOMESTIC AND FOREIGN MONEY ORDERS BY TELEGRAPH AND CABLE.

THE
Canadian Pacific R'y Co's Telegraph

Executive Offices, Montreal
JAS. KENT, Manager

The Largest Telegraph System in Canada
68,261 miles of wire; 1880 offices

DIRECT CONNECTION WITH
POSTAL TELEGRAPH-CABLE COMPANY

COMMERCIAL
ATLANTIC—CUBA—PACIFIC
CABLES

Halifax-Bermuda and Direct West India Cables
United States and Hayti Cable
British Pacific Cables Alaska Cables
Dominion Government Lines to the Yukon
Newfoundland Government System

DIRECT THROUGH WIRES TO ALL PARTS OF
CANADA
NEW YORK CHICAGO SAN FRANCISCO
BOSTON PHILADELPHIA
ETC.

The North American Telegraph Company.

Organized 1886.

GENERAL OFFICES, MINNEAPOLIS, MINN.

H. A. TUTTLE, Sec'y and Gen'l Manager. CLINTON MORRISON President.

Its lines extend through the States of Minnesota, Wisconsin, Iowa and Illinois.

Connecting with the
POSTAL TELEGRAPH-CABLE CO.,
and the
COMMERCIAL CABLE COMPANY
COMMERCIAL PACIFIC CABLE COMPANY.
COMMERCIAL CABLE CO. OF CUBA.

Exclusive direct connection with the telegraph lines of the Minneapolis, St. Paul and Sault Ste. Marie Railway Company.

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TELEGRAPH AND ELECTRICAL TRADES DIRECTORY

CONDENSERS.

William Marshall, 709 Lexington Ave., N. Y.

FIRE-ALARM AND POLICE TELEGRAPH.

Gamewell Fire Alarm Telegraph Co., 19 Barclay St., New York.

INSULATORS.

Specify BROOKFIELD GLASS INSULATORS, THE STANDARD

BROOKFIELD GLASS COMPANY,
United States Express Building, Trinity Place, Greenwich and Rector Streets.

PRIMARY BATTERIES.

Edison Manufacturing Company, Orange, N. J.

TESTING INSTRUMENTS.

Weston Electrical Instrument Co., Newark, N. J.

STORAGE BATTERIES.

The Electric Storage Battery Co., Philadelphia.

TELEGRAPH AND CABLE COMPANIES.

Canadian Pacific Railway Co.'s Telegraph, E. M. Bender, purchasing agent, Montreal, Que.

Commercial Cable Co., Commercial Pacific Cable Co., German Atlantic Cable Co., W. D. Francis, purchasing agent, 14 Desbrosses St., New York.

Great North Western Telegraph Co. of Canada, Geo. D. Perry, purchasing agent, Toronto, Ont.

North American Telegraph Co., H. A. Tuttle, general manager and purchasing agent, Minneapolis, Minn.

Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

Postal Telegraph-Cable Co. of Texas, S. M. English, general manager and purchasing agent, Dallas, Tex.

Western Union Telegraph Co., Executive Offices, 195 Broadway, New York; purchasing agent, H. E. Roberts, 152 Franklin Street, New York.

DEAN RAPID TELEGRAPH CO.
Cheap Rates : : : : : Quick Service
Accuracy and Secrecy Guaranteed.
General Office : : : : Kansas City, Mo.

TELEGRAPH AND ELECTRICAL SUPPLIES.

J. H. Bunnell & Co., Inc., 20 Park Place, New York.

Central Electric Co., 264-270 5th Ave., Chicago.

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Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Detroit, Mich., June 23, 24, 25, 1909.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Atlantic City, 1909, at a date to be named later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

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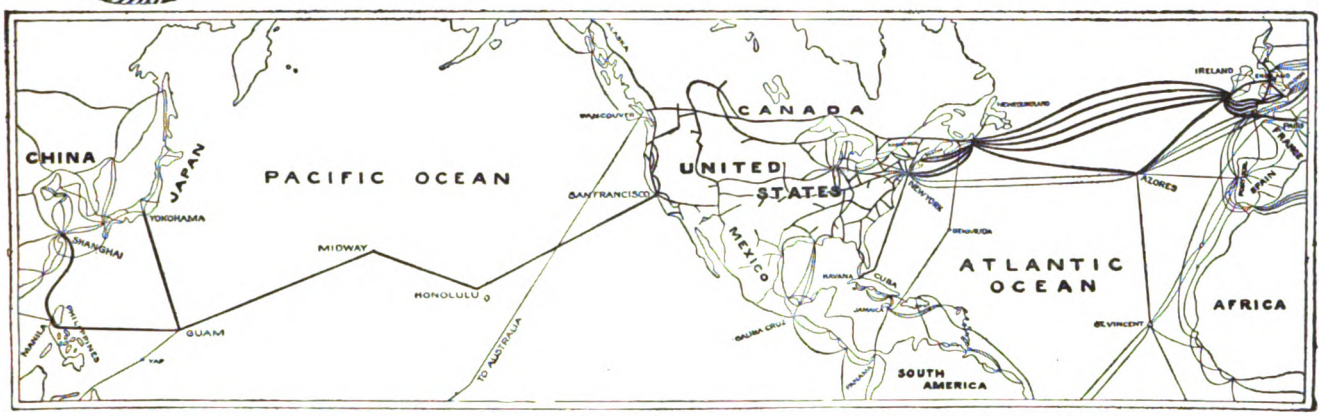

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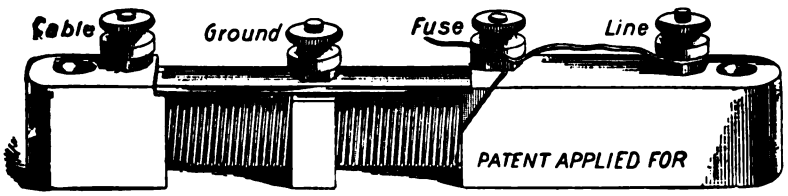

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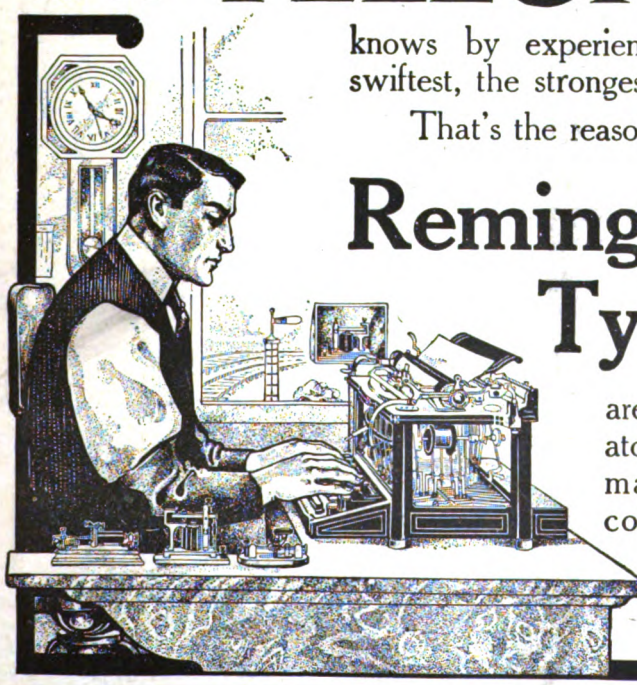

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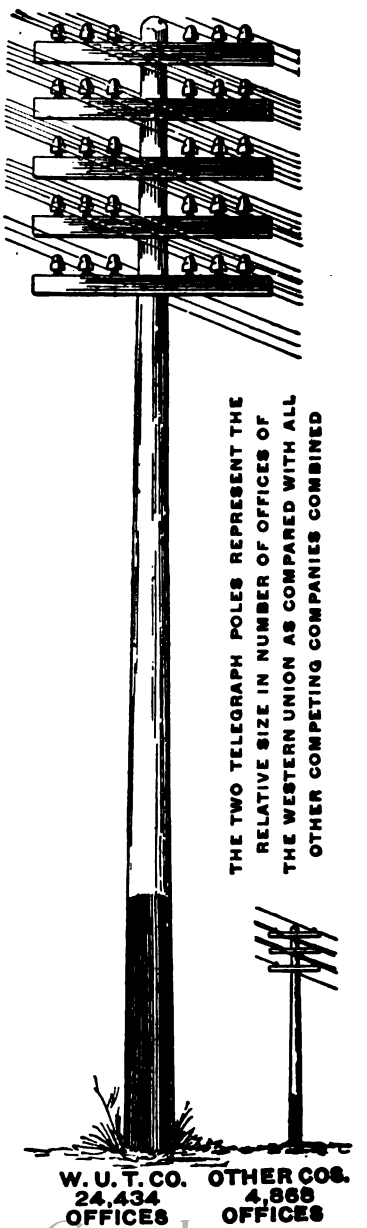

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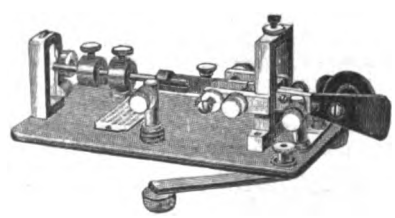

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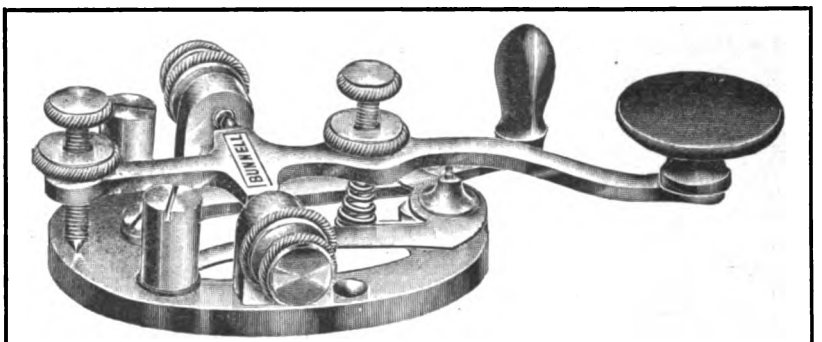

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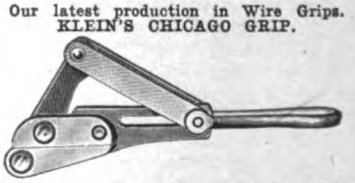

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

The Chemical Rectifier.

The chemical, like the mercury vapor rectifier, is a device for transforming alternating currents into direct currents and accomplishes that end in like manner through the three-cornered arrangement of one cathode and two anodes.

The accompanying diagram, Fig. 1, shows the connections and coil arrangement of the secondaries in the supply transformer. It will be seen that the type of transformer used differs from the ordinary pattern inasmuch as the secondary possesses a center tap, and that more than one secondary is usually put into each transformer, the number being regulated in accordance with the value of the direct voltage desired. If, for instance, a direct voltage of, say, 100 is required, one transformer with one primary and two secondaries, as illustrated in the diagram, is advisable, the primary, of course, being wound suitably for the supply pressure to which it is connected. Only a single phase is used, so the number of cycles of current need not be considered.

If a direct current of 50 volts pressure is desired from each cell, the secondaries of such cells must be wound to 100 volts A. C. for the reason that one-half of the winding is always "dead" because a positive current will not flow from one aluminum rod to the other, or from either aluminum rod to the lead plate, while a negative current will pass from either aluminum rod to the lead plate freely. This causes the aluminum rod and the half secondary attached to it to be "dead" when it is positive and "alive" when it is negative, thus invariably creating positive at the center tap. If an external circuit be connected at this point it is obvious that a continuous or direct current will flow therein.

The object in having more than one secondary and jar is to avoid the possibility of a too-high A. C. voltage, forcing a positive current from one aluminum rod to the other. However, there is really very little chance for this to happen, as it would require more than a thousand

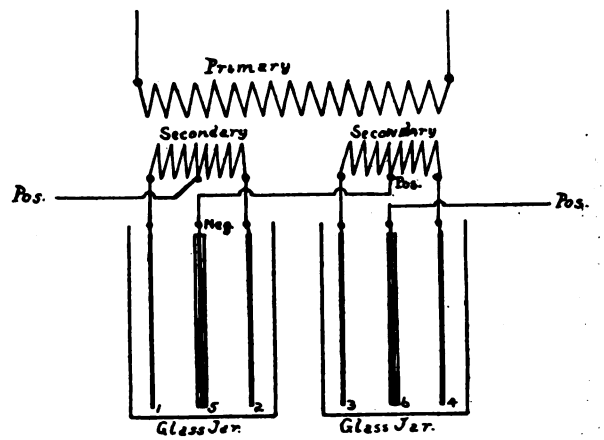

FIGURE I.

volts to do it where the liquid solution in the jar is in good condition.

THE SELECTOR.

The selector is a comparatively recent invention. Its purpose is to select a particular office or station from a number of others on the same circuit and at that point only ring a bell continuously until the party signaled shuts it off by means of a push button or other device. The operation requires but a very few seconds of time after which the wire may be immediately placed in regular service again. The principal advantage possessed by the selector as a call-box system is that it is a "long distance" method and does not prohibit the regular use of the wires through its connection therewith.

The principle of operation is almost identical with that employed in unlocking a combination safe lock. For instance, no amount of turning or twisting of the knob or handle of a safe door will unlock it unless the movements are done in a

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methodical manner, step by step, and in a regular order of rotation.

In the selector system the lever of the ordinary Morse relay in the circuit actuates the mechanism of the selector controlling the prearranged combination through its back-stop contact point, which latter, of course, is especially insulated from the front stop controlling the regular Morse sounder. The regular local battery operates both the sounder and the selector magnet according to the position of the relay lever.

It is obvious that the selector, like the handle of the safe door, may be kept in irregular activity all day without unlocking. Hence, the regular movements of the relay lever which occur at all times when the Morse circuit is in operation cause no signal to be recorded, but the moment the prearranged call, usually consisting of five figures, are transmitted over the line in a methodical step by step manner, the mechanism of the selector is unlocked and releases a little lever which then closes a local circuit containing a bell and rings it. The moment the bell circuit is closed an automatic signaling device at that station becomes active and returns an answering signal to the calling station, thus announcing the actual delivery of the first call.

The unlocking signals are transmitted over the line by means of an ordinary breakwheel and crank similar to those used in the ordinary call-box systems. Each opening of the circuit thus causes the distant Morse relay lever to fall to the back stop. In this position the lever shifts the local battery to the magnet of the selector and thus actuates the armature controlling the unlocking mechanism.

The signal usually consists of five figures, each numeral of which is represented by as many "dots," or, rather, openings of the circuit, as the figure represents. Thus No. 12345 would be transmitted as one, two, three, four and five dots or breaks, respectively, instead of Morse, characters representing the figures.

In telegraph service it is possible to make these signals by hand instead of using the breakwheel. The system is also adapted to telephone circuits and although the arrangement is slightly modified, the principle of operations is the same.

Business Notice.

The business of the Battery Supplies Company, Newark, N. J., manufacturers of the Gladstone Lalande battery and the newer type known as the Bsco battery, has been acquired by the Edison Manufacturing Company, Orange, N. J., together with all patents, rights, etc., appertaining to the manufacture of those batteries. On September 1, 1908, the name of Battery Supplies Company was discontinued, and that company merged with the Edison Manufacturing Company, Orange, N. J. The essential features of the Gladstone Lalande battery being similar to those of the Edison primary battery, and as the Gladstone battery elements were designed to be interchangeable with the Edison types, the Gladstone Lalande battery will be retired, and cells or renewals of the Gladstone Lalande battery should be ordered by the Edison types. The Edison Manufacturing Company will continue to make the Bsco 350-ampere hour cell for railroad work, and in addition the same type of cell, with special low-temperature electrolyte, for the same class of work at points where low temperatures affect the ordinary sodium hydrate electrolyte. The Bsco battery will also be manufactured in the 200-ampere hour size, in two different styles; one with a liquid-tight, steel enameled jar, for portable engines and marines used on fresh water; the other with a liquid-tight porcelain jar for use on launches running in salt water and on stationary engines.

Recent Telegraph Patents.

A patent, No. 895,350, for a multiplex telegraph system, has been awarded to Amor W. Douglas, of Albuquerque, New Mexico. A multiple telegraph system in which sending and receiving signaling apparatus responsive to alternating currents are employed in connection with a simple Morse system.

A patent, No. 895,714, for a binding post, has been secured by Garrison Babcock and Josef Reuter, of Rochester, N. Y. The base member has an incline clamping face at one end and a pivot slot at the top. A clamping plate is forced down on the wire by a threaded nut.

A patent, No. 895,747, for a binding post, has been obtained by Monroe Guett, of Hartford, Conn. The cylindrical binding post has two openings into the central bore. Non-rotatable binding studs movable lengthwise through the openings are connected by a bridge.

A patent, No. 897,062, for a cable terminal, has been granted to Frank B. Cook, of Chicago. A cable terminal used with telephone, telegraph and other electrical cables for the purpose of distributing the conductors of the cables and protecting the same against injurious electricity of various forms.

A patent, No. 897,454, for a telegraphic transmitter, has been awarded to George A. Cardwell, of New York. A mechanical transmitter for attachment to a typewriter whereby the signals in any desired code, such as the Morse alphabet, may be automatically transmitted by the ordinary operations of manipulating the typewriter keys.

A patent, No. 897,662, for a telegraph selective system, has been taken out by Alfred Moss Roberts, of Buffalo, N. Y. A telegraph system in which code signals are automatically switched or directed to a mechanism which causes a printing or recording of the particular letter corresponding to the code signal. It is a multiplication of a quadruplex telegraph system.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part VII.)

THE TRANSMITTER—CONTINUED.

In order to insure satisfactory work at the required speeds, the regulation of the various parts named must be very precise, as must also that of the jockey wheel, J*, which is a device of considerable importance, inasmuch as it completes the work of the collet rods by securely holding the reversing lever in either of the positions into which it is thrust by the action of the collets. This wheel or roller is fixed at the end of a flexible spring, which presses the roller down upon the uppermost edge of the lever and jerks the latter over to the proper position whenever the top of the lever is pushed beyond the center of the roller by either of the collets. In this way the lever is firmly retained in the position into which it is forced by one collet until it is pushed over to the opposite side by the other collet, thus establishing solid and steady contacts between line and dynamo.

The legibility of the signals would be utterly destroyed but for the use of the jockey wheel J, which converts the comparatively slow and uncertain actions of the reversing lever (when actuated by the collet rods alone) into quick and decisive movements that insure the transmission of currents of the duration and steadiness requisite for rapid signaling. The pressure exerted by the roller should not be too great or the lever will stick, but should be sufficient to promptly force the lever to either of its limiting stops, D or D¹, the very moment it is pressed by the collets over the center of the roller.

If proper adjustments have been secured, a series of well defined clicks of perfect regularity may be heard when the transmitter is reversing at low speeds; and the formation of the outgoing signals can be clearly and distinctly traced upon the pole-changing device as the slip passes through the transmitter.

The tendency of the collets to shift under the rapid succession of taps imparted to the lever, constituted one of the most fruitful sources of trouble in the original transmitters, but that difficulty is now minimized by the use of checknuts carried on the collet rods and placed immediately behind the collets, which are thus prevented from working loose. The collets, it may be remarked, are now made of ivory, with the view of obviating "shocks" whenever other parts of the apparatus happen to be touched while adjusting or removing the "bias," which is more or less liable to show on every transmitter.

This bias may arise from an inequality in the potentials of the split batteries or dynamos employed; or from any marked difference that may exist in the value of the resistances placed in each of the dynamo leads; as well as from extraneous leakage currents, which have the effect of strengthening one and weakening the other of the signaling currents, and thus producing a marking or spacing deflection upon the distant galvanometer according to the polarity of the leakage currents.

In general, however, the bias comes from irregularities in the transmitter itself, and is caused either by (1) the collets being improperly placed; (2) imperfect adjustment of the contact screws; (3) faulty regulation of the jockey roller.

The result in either case is to produce a dissimilarity in the duration of contact between the lever and upper stop on the one hand, and the lever and lower stop on the other. Any such disparity will cause currents of unequal strength to flow to line during reversals, and the more powerful of these will naturally prevail and develop a bias.

If, for instance, the contact between the upper post D and lever L is more prolonged than that between the latter and the lower post D¹, a stronger negative than positive current will pass to line, and a marking bias will manifest itself upon the distant galvanometer, which, on the other hand, will show a spacing bias in case the positive current should predominate owing to a reversal of the above conditions. When the potentials are exactly equalized, and similarity of contacts has been perfectly established between the opposite poles and line, the galvanometer will practically remain at zero under rapid reversals of current; and this fact will generally serve as a guide to the proper adjustment of the transmitter for bias.

Where a very high speed is a desideratum, it is very necessary that the bias should be minimized or entirely removed, and to this end the following points should be carefully noted in adjusting the transmitter: (a) There should be absolutely no break or interval between either of the pins, P, P¹ and the horizontal arms of levers A, A¹, while the beam RB is rocking and no slip is passing through the transmitter; or, in other words, the levers A, A¹ must follow the pins P, P¹ throughout their full phase during reversals. If this does not happen, it will indicate that one or other (possibly both) of the collet adjustments is at fault, and the particular collet concerned must be moved to the left of lever L, so as to increase the upward play of the arm that shows the break; (b) the position of the screws D, D¹ must be such as to allow the vertical bar L to move through an equal distance on either side of the center of the jockey roller J.

Perhaps the best way to secure this regulation is to first close up the contact screws until the reversing lever stands perpendicularly and lines correctly with the axis of the jockey roller. Then open the screws until the play of the lever is the same on either side of its pivotal points, while leaving openings as small as possible consistent with the transmission of clear signals to line.

If, now, when the transmitter is started the succession of clicks of which previous mention has been made does not give out that continuous

* See Fig. 21 in September 1 issue of Telegraph Age.

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rhythmical sound which results from the regularity of vibration, it will be an indication that the collets either require moving a little further to the left, or that the spring of the jockey wheel needs a little more pressure. In finally determining whether or not these adjustments have been properly made, it will be well to punch a series of center holes in a piece of slip and run

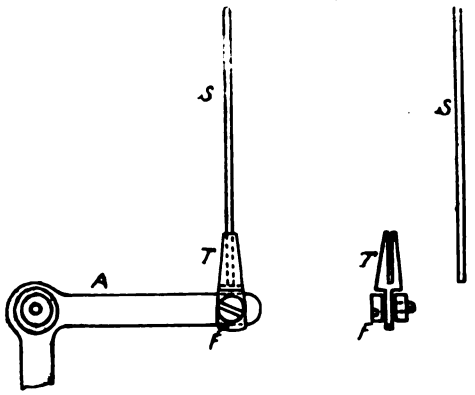

FIG. 23—TRANSMITTER NEEDLES AND SOCKETS.

it through the transmitter. If the regulation of the latter is correct the vertical bar will not stir so long as the paper is passing, and will remain indifferently on either of the contact stops when placed there by finger. Should, however, the lever oscillate under these conditions, both collets will have to be moved so as to increase their

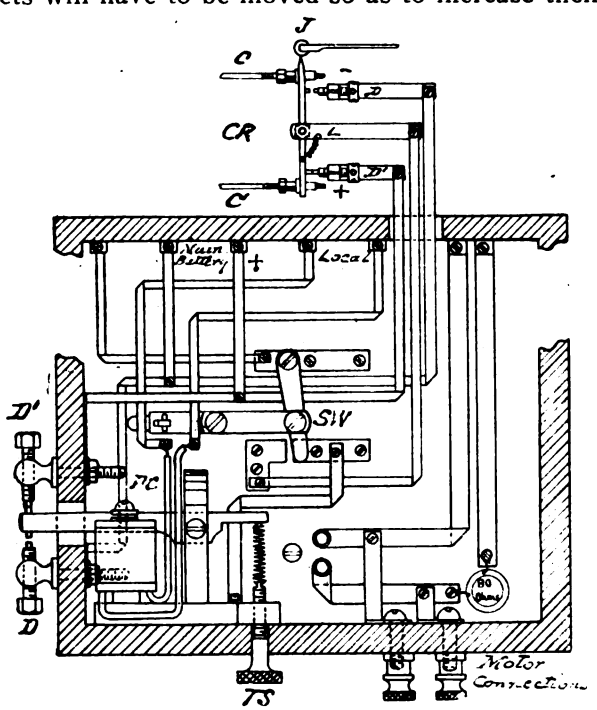

FIG. 25—WIRING ARRANGEMENT IN BASE OF TRANSMITTER.

distance from the lever; or, in case the latter simply tends to remain firmly upon any one particular stop, the collet producing this result must be turned further away from the lever.

It occasionally happens that irregularities of this nature are developed by the shortening of the upright needles M and S, a result brought about by the gradual wearing of their upper ends through continual contact with the paper ribbon. In such an event the play of the collet rod—or rods, as the case may be—will not be limited sufficiently to prevent the lever becoming actuated when it ought to remain stationary.

The tendency of the needles to shorten is

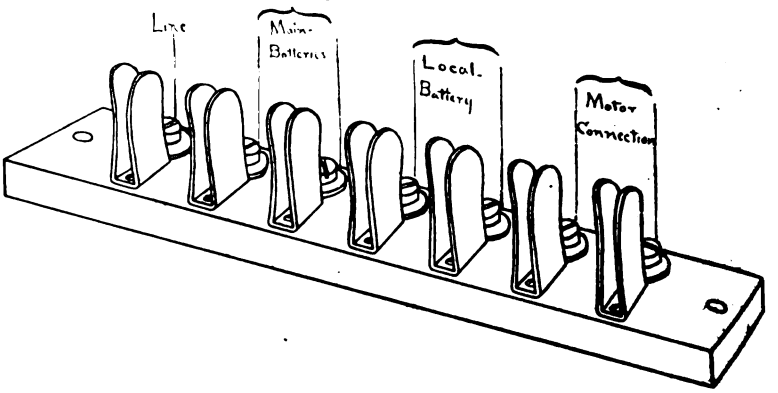

FIG. 24—TRANSMITTER CLIP.

minimized by a device which admits of their being hardened at the top, and in this way to make them last longer. This was found impracticable under the old arrangement, where needles were hinged directly to the rocking levers, and had frequently to be cut at their upper extremities in order to accommodate the variety of transmitters in use, which did not admit of a standard size of needle being employed.

The device referred to is shown in Figure 23, where T represents a conical shaped steel tube or socket into which the needle S is inserted after being cut to the required length at its lower or annealed end, as well as rounded off and hardened at its upper extremity. The

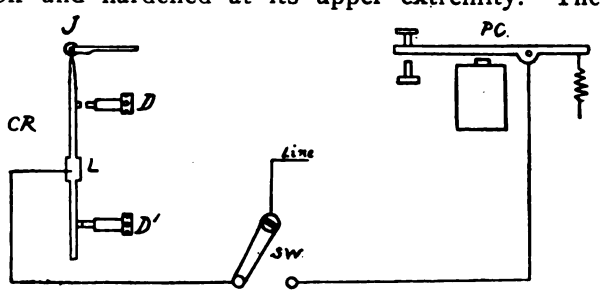

FIG. 26—THEORETICAL SWITCH ARRANGEMENT IN BASE OF TRANSMITTER.

socket, which is hinged on the horizontal arm A by means of the shouldered screw F, is split down the center, as shown in the figure, so as to impart flexibility to the holder, and thus enable the needle to be tightly gripped and securely held in position.

Another convenient and useful device is one for obviating the use of binding posts on the transmitters. This device consists of a series of stout brass pins fixed inside the base of the transmitter and which fit into a corresponding row of brass clips (Fig. 24) permanently fastened to the table. The brass pins which constitute the terminals of the various main and local features

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inside the transmitter, form a junction with their external line and dynamo connections through the medium of the metallic clips to which the said connections are made. In this way it is possible to change a faulty transmitter with great convenience and rapidity, as all that is necessary is to lift the defective instrument from off the clips and drop a good one in its place, without the loss of time or trouble involved in effecting the change in the customary way. The same principle has also been applied to the various receivers and galvanometers with advantageous results.

The polechanger, P.C. (Fig. 25), which is used for hand signaling, is placed almost entirely inside the base of the transmitter, the remote end of its armature and polar contacts alone being exposed through the side of the instrument. The wiring arrangement in the base of the transmitter is illustrated in the figure, stout brass strips being employed to make the various connections.

The switching device for transferring the main line from the hand polechanger, P.C., to the automatic current reverser, CR, or vice versa, is also shown, but will perhaps be more readily understood by reference to the theoretical sketch, Fig. 26, in which S.W. represents a switch that is thrown into the position shown upon "starting" the transmitter, and into the opposite position upon "stopping" it. By the former of these movements, it will be seen, the automatic portion of the apparatus is connected directly to line, while by the latter movement connection is established between the line and polechanger P.C.

Adjustments of the latter instrument are made by means of the thumbscrew, T.S. (Fig. 25), or by slight alterations in the positions of the battery posts, D, D'.

(To be continued.)

Personal.

Mr. David S. Anderson, one of the best known of old-time telegraphers in Chicago, and manager of the Western Union office on the Board of Trade, that city, accompanied by his wife, has been making an extended vacation trip through Canada, his itinerary taking him to Montreal and Quebec and the famous Saguenay River.

Brigadier General James Allen, chief of the Signal Corps, is in France, sailing therefor on September 5. His mission is to represent the United States at the conference at Marseilles, called to consider wireless telegraphy, wireless telephony and aeronautics. Commander Chapin, of the navy, is an associate delegate with General Allen.

Mr. S. Edwards, superintendent of the government telephone system in Alberta, Dominion of Canada, has resigned on account of ill health. He will make his future residence at Winnipeg, Man. Mr. Edwards was formerly a superintendent of the Canadian Pacific Railway Company's Telegraph at Calgary, a position he resigned in March 1907, to accept that from which he has now retired.

The friends of Francis W. Jones, of New York, formerly electrical engineer of the Postal Telegraph-Cable Company, will rejoice to learn that he is rapidly recovering from an operation performed at the Roosevelt Hospital, on August 26, overcoming a trouble believed to have been the outcome of an attack of grippe sustained by him last December.

Mr. George M. Myers, capitalist and a well-known business man of Kansas City, Mo., has been appointed a fire and water commissioner of that place, under the new charter. Mr. Myers is a public-spirited citizen and prior to this appointment served with much credit on the utilities commission. He was formerly in the telegraph business, in which he had a brilliant and successful career. He is a native of New York, and is now nearing his fifty-third birthday.

The Cable.

A German cable company capitalized at between $6,000,000 and $7,000,000, and guaranteed by the imperial government, has been organized for the purpose of laying a cable between Germany and South America.

The French Cable Company has been fined $5,000,000 by Venezuela, for alleged complicity in the Matos rebellion in that country. It is declared that the company must also pay a further sum to the Venezuelan government, an amount to be assessed later by experts.

The new submarine telegraph cable, recently laid by Messrs. Siemens Brothers and Company, between Sebastopol and Varna, is reported to be working perfectly. The first messages exchanged over the cable were cordially-worded telegrams between the Czar and Prince Ferdinand.

Mr. George Gray Ward, vice-president and general manager of the Commercial Cable Company, New York, who went abroad April 15 for the purpose of attending the International Telegraph Conference at Lisbon, will sail for home from England September 17, on the Baltic.

Daniel Morrison, for the past five years located at the Midway Island station of the Commercial Pacific Cable Company, and who has been on a leave of absence for the past three months, dividing his time between this country, England and Scotland, left New York, September 4, for Honolulu.

Cable communication was interrupted September 12 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzorote (Canaries)	May 18, 1908
Messages go by steamer from Las Palmas.	
Macao	Aug. 29, 1908
Messages are mailed from Hongkong.	

Telegraph Age is the leading journal of its class in the world, and should be in the hands of every progessive operator; $2 a year.

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Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. Thomas F. Clark, vice-president of the company, is absent on a vacation, seeking rest and recreation in the Adirondacks.

Vice-President George W. E. Atkins, who has been a sojourner at Seabright, N. J., during the summer, going out and in to business every day, is again domiciled in his city home.

Mr. John C. Willever, chief clerk to the president and general manager, who is again at his desk, spent his vacation in the Adirondacks.

Mr. Emory Cobb, a forty-niner of the telegraph and a retired banker of Kankakee, Ill., was a recent visitor, calling on Colonel R. C. Clowry, who is an old personal friend.

Reports to the auditors of the company show that, while business is not what it was in comparative years, it is improved over recent months. The company was never in better physical condition than at present, and its employes are more satisfied. The company, while it has eliminated considerable material and labor, has maintained its efficiency.

Earnings of this company for the September quarter, estimated in part, show marked improvement over the actual figures for the same time last year and in 1906, net revenue amounting to $1,700,000, compared with a deficit of $311,493 in 1907, and the surplus after charges and interest amounting to $769,149, compared with a deficit of $1,961,580 in the same time a year ago. The actual returns for the June quarter show a surplus of $649,052, against a deficit in the June quarter last year of $68,324. A quarterly dividend of one-half of one per cent. has been declared, payable October 15.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

With the exception of Minor M. Davis, electrical engineer, who is away on his vacation, all of the executive officers are again at their desks, refreshed from their summer outings. A general atmosphere of close business application is observed on all sides, indicative of an increased efficiency in the telegraph service, if that be possible.

This company is constructing new lines in Nevada and California. Work is already well advanced on the section between Goldfield and Tonopah, and will be carried further to Reno, Nev. From the latter point it will be extended over the mountains to Sacramento and San Francisco. A line will also be built via Ely from Goldfield to Salt Lake City.

Mr. William J. Camp, electrical engineer of the Canadian Pacific Railway Company's Telegraphs, was an executive office visitor on September 9, coming to New York on business connected with the service.

RESIGNATIONS AND APPOINTMENTS.

In the district presided over by Mr. C. B. Arrington, superintendent at Nashville, Tenn., the following changes are recorded:

J. J. Cooper has been appointed manager at Henderson, Ky., vice W. B. Harriss, transferred to Paducah, Ky. Mr. Cooper has been manager at various small offices in the South for this company for several years, namely at Fernandina, Fla., Douglas, Ga., and Marietta, Ga. Mr. Harriss has been manager at Henderson for the past four years, and this change is one of promotion.

J. B. Allen, manager at Paducah, goes to Knoxville, Tenn., vice W. R. Hurst, transferred. Mr. Allen has been manager at Paducah for the past eight years, and his transfer is also in the line of promotion. Mr. Hurst has been appointed chief clerk in the Nashville office, succeeding J. F. Livingston, who has resigned to enter other business. Mr. Hurst was manager at Knoxville for four years, and prior to that time had seen service in Cuba with the United States government.

Another appointment is that of M. J. Hyland, who has been made manager at Bradford, Pa., vice H. F. Kelleher, resigned.

William J. Fish, formerly with the Chicago and Northwestern Railway Company, at Escanaba, Mich., has been appointed manager of the Postal office at Calumet, Mich., vice I. J. Roedel, resigned to go with a broker.

A Gigantic Telegraph System.

An English cable expert who has evidently made a careful study of his subject, sends us the following, which by means of comparison, conveys an idea of the extent and magnitude of the business handled by the Western Union Telegraph Company, facts which, as a rule, are not readily grasped or comprehended by the average European:

"The latest (1906) official telegraph statistics relating to European countries disclose the fact that the combined public systems of France, Germany, Russia, Austria-Hungary, Italy, Belgium and Portugal were exceeded in extent by that of the Western Union Telegraph Company, which at the close of its financial year, 1906-7, was operating 1,321,199 miles of wire.

"In the preceding twelve months 65,052 miles were added to this gigantic system. This addition of mileage alone exceeds the established systems of Holland, Switzerland, Sweden and Denmark.

"The number of telegrams sent by the company during the same period were sufficient, if distributed among the inhabitants of the United States to enable nearly every man, woman and child in the Republic to receive one.

"If the blanks used by the senders of these telegrams could be placed one upon another a tower nearly twelve miles in height would be the result."

There is much for telegraph operators to learn respecting their calling which can be readily obtained by reading Telegraph Age—$2 a year.

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John Brant—In Memoriam.

BY WALTER C. BURTON.

The late John Brant was employed for nearly forty years in the service of the Western Union Telegraph Company at New York. He cheerfully rendered to his employers the best that was in him, and only when failing health compelled it did he surrender his place at the key. And now he is gone, and every man and woman who enjoyed his friendship is conscious of the fact that a strong arm has fallen, that a great spirit has found rest, and that the world has perceptibly narrowed becaused a tried and true friend has passed out of it.

There was no interest of the telegraph fraternity that did not command the active and hearty support of John Brant. He was for many years a member of the Telegraphers' Mutual Benefit Association, and always urged its claim upon the consideration of eligible operators. He was an active and helpful force in the development of the New York Telegraphers' Aid Society. He was a director of the Serial Building, Loan and Savings Institution, which has done so much to develop habits of thrift and economy among telegraphers, and was for some years its vice-president. It was as an associate on the board of directors of that organization that the writer came to a full knowledge of the exalted ideals of business and personal integrity, which were the law of Mr. Brant's life. In the panic times of 1893, when the building association was about to mature its first series of shares, involving the payment of a large sum of money, and anxious thought was being given by the board of directors, Mr. Brant's voice and vote were invariably on the side of conservative care for the interest of all the holders of later series of stock, though self-interest, had he considered it for a moment, would have dictated otherwise. His free will service to this great organization over many years contributed not a little to its success and its present strong and permanent condition.

When the question of pensions for aged telegraphers was being discussed some years ago, he was deeply interested and earnestly desired that some plan might be devised which would be just and equitable to employer and employe.

For many years he was a regular attendant at the dinners of the Magnetic Club, and always participated with keen enjoyment in such social affairs. But notwithstanding his long period of service in the New York office, and his active interest in all the beneficent organizations of telegraphers, Mr. Brant will be best remembered as the secretary of the Old Time Telegraphers' and Historical Association. It was in this capacity that the energies of his riper years found expression, and the social and fraternal character of the reunions appealed most strongly to his warm and friendly nature. His untiring zeal in procuring transportation added greatly to the attendance at the annual reunions, and no old timer, even from the remotest corner of our great country, was denied the means of getting to the reunion. The legal restriction against the issue of railroad passes was almost coincident with Mr. Brant's physical disability. Whatever the future may have in store for the Old-Time Telegraphers' Association under the altered conditions affecting transportation, there are hundreds who will hold in grateful remembrance the unselfish labor of John Brant which rendered possible their participation in many of the Old Timers' reunions.

To have lived to three score years, rendering unto every man that which was his due, discharging with scrupulous fidelity every obligation of ethics and of friendship; rendering an unqualified service to every beneficent organization of telegraphers; enduring a long illness with courage and uncomplaining cheerfulness, and leaving behind a veritable army of men and women who mourn because his friendly handshake, his cordial greeting, and his cheerful smile abide with them no more, is to have lived a successful life. Judged by the highest and most enduring standards, John Brant's life was a successful life.

Loyal comrade, faithful friend, farewell and farewell!

Death of George H. Corse.

George H. Corse, of Ogden, Utah, a well-known telegrapher, and for many years actively engaged in the railroad service, died August 26. He was a native of Berlin, Germany, where he was born August 4, 1847. He came to this country early in life, and when but sixteen years of age became a telegraph operator at Fort Madison, Iowa, in the service of the Burlington road. Promotions were rapid and he held many different positions. He became agent of the Union Pacific railroad at Ogden in 1890, at a time when the importance of that place as a railroad center became very generally recognized. Mr. Corse continued to hold this position until 1904, when, owing to a transfer of interests, and ill health, he retired from business. For the past four years he had been confined to his bed and during the last two years was totally blind and helpless. In 1902 he was president of the Old Time Telegraphers' and Historical Association, the year in which its reunion was held at Salt Lake City. Mr. Corse was a prominent Mason, also belonging to the Order of Elks.

Obituary Notes.

Robert G. Davidson, aged sixty years, a Western Union telegraph operator at Chicago, well and favorably known in that city, and a southerner by birth, committed suicide August 20.

R. S. Quigley, a former telegrapher, aged forty-three years, and until recently superintendent of the Hocking Valley Railway, a position from which he was forced to retire in May last because of ill health, died at Columbus, O., August 17.

George W. Uber, a Philadelphia Western

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Union operator, died suddenly of heart failure in his home, September 8. He had been an operator for nearly thirty years, and was considered one of the most expert of baseball telegraphers. For a number of years past he has been taking the weather bureau signals in this city.

George H. Albee, aged sixty-nine years, a well-known old-time telegrapher, and a member of the Old-Time Telegraphers' and Historical Association, died at Windsor, Conn., on August 26. He was born at Hallowell, Me., learned telegraphy in 1855, and subsequently filled numerous important positions, in his native state, at Boston, and at Norwich, New Haven and Hartford, Conn. For many years he was a justice of the peace in Hartford County.

Radio-Telegraphy.

It is stated that work has been begun on a wireless station in the Vatican gardens, Rome, and that its effective range will be 400 miles.

A powerful "wireless" station has recently been opened at Emden, Germany (the most important submarine telegraph center on the Continent of Europe), for the training and examination of operators in wireless telegraphy desirous of obtaining employment on liners flying the German flag.

The Amalgamated Company's station at Knock Roe, near Tralee (Ireland), is nearing completion, and Hubert Malpas, joint managing director of the company, states that the Canadian government has granted the company a license for a site at Cape Canso, N. S., where transatlantic transmission will be attempted with a power which Mr. Malpas estimates at one-fourth that employed by the Marconi system.

A patent, No. 896,130, for a receiver for wireless telegraphy, has been granted to Guglielmo Marconi, of London, England. In a receiving apparatus for wireless telegraphy, the combination with an oscillatory circuit, of an oscillation valve, an induction coil and a condenser, said valve, condenser and the primary winding of the induction coil being connected in series and operatively connected with said oscillatory circuit, and a detecting device connected with the secondary winding of said induction coil.

It has been proposed by Mr. Hunt, the Australian Commonwealth meteorologist, that, in addition to the wireless receiving stations to be established by the government on the coast which can obtain weather reports from ships in the Indian and Southern oceans, a sending and receiving station should be built on Amsterdam Island, situated about midway between the west coast of Australia and the southern extremity of Africa. The island is in an almost direct line between Tasmania and Cape Town, in the midst of a vast oceanic space where weather systems are formed and storms are generated.

Lieutenants Colin, Jeance and Mercieri, the inventors of the wireless telephone apparatus which recent tests have shown to accomplish remarkable results, achieved a notable success with their new instruments on August 15, at Paris. Communication was established between Paris and Raz de Sein, Department of Finisterre, a distance of about three hundred and ten miles. The transmitted words were faint, but could be plainly distinguished. The officers are confident that they can make improvements in the apparatus enabling the exchange of conversation up to six hundred or seven hundred miles.

On his arrival in Germany, Dr. P. J. H. Poli, director of the Aix-la-Chapelle Meteorological Observatory, announced an interesting feat in connection with weather reports by wireless messages from aboard the Hamburg-American steamship Auguste Victoria on her last voyage from New York. Speaking of what he had accomplished, Dr. Poli said: "I succeeded in taking wireless weather reports a distance of 800 miles from the American and 1,200 miles from the European coast, and with the assistance of wireless reports from passing vessels, I was enabled to draw up correct weather maps for a distance of 800 miles ahead."

Early Marine News Gathering in Boston.

In these days of wireless telegraphy, when marine news is transmitted to land from vessels far out at sea, it is hard to realize the great diligence and ingenuity once required to learn anything at all about incoming ships.

Samuel Topliff of Boston, says the Boston Globe, established the first real regular marine service in Boston. He gathered a good deal of his information by the employment of a telescope stationed at the top of his house at 32 Washington Square, Fort Hill, that location being then a hill in more than name.

The story of Mr. Topliff's career and of the newsroom which he conducted in the old State House, sheds interesting light upon local history in the first half of the last century.

He was born April 25, 1789, in the two-story wooden building owned by his father, near Hollis street, on what was then Orange street, but now bears the name of our first President. In his early youth he was an alto singer in the Hollis street church, which stood on the site of the present theater of that name, and in 1800 he had a share in a memorial funeral in honor of Washington.

He was a supercargo in the employment of William Gray, then Boston's most prominent merchant, and he had gone on several voyages to the West Indies and South America before he became, in 1811, a clerk in the employ of Samuel Gilbert, of Boston, the proprietor and originator of the first commercial news room in this country. Topliff's salary in this capacity was $700 a year, pretty good pay in those days for a young man of twenty-two.

The office of the Commercial newsroom, for whose marine intelligence young Topliff had now assumed the responsibility, was then in the Ex-

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change coffee house, which had been built three years before, with special reference to the wants of the merchant princes. Its reading room aimed to give the earliest European news, and also news of the arrival of any vessel, coastwise or foreign, not only to its owner, but to the other merchants.

As this was the only means Boston then afforded of obtaining such news, it was necessary for the merchants to subscribe to the room's support in order to know how to buy stocks.

Mr. Topliff's accuracy became so well known that his name was frequently forged at the end of dispatches with the hope of enhancing the price of certain commodities and inflating stock values.

One example of such a forgery appears in the following letter relative to the war of 1812:

Exchange Coffee House,
Boston, Dec. 7, 1813—9 o'clock evening.

To the Editor of the Salem Gazette—I hasten to inform you of the arrival late this eve of the Russian ship Catherine, 68 days from Archangel, bringing the highly important intelligence that our ministers had been received at St. Petersburg by a British minister from England & that it was expected that peace would immediately take place. This is all I can obtain tonight. I have just seen the Captain. We are all in confusion here & those that have dealt largely in speculation are crazy crazy!! The Postmaster has been kind enough to open the mail for this—I have sent to New York. Yours, (Signed) Sam Topliff.

This letter was never published, however, as it was recognized to be spurious. The Salem Gazette for December 10, 1813, rebuked thus sarcastically the unauthorized use of Mr. Topliff's name:

The witty and adroit gentleman, who on Tuesday evening, under the respectable name of Mr. Topliff, attempted to impose upon us his own silly inventions as the news of the day, is informed that he succeeded in robbing us of the postage of his letter, but that in other respects his awkward hoax failed of its intended effect.

We mention this occurrence merely to protest against the practice of trifling with the feelings of the public and exciting false hopes, for the purposes of speculation or to gratify thoughtless or malicious wit.

The meritorious exertions of Mr. Topliff, the very reputable journalist of the Boston Exchange Coffee House, to furnish the public with early and correct intelligence, entitle him to general confidence, support and gratitude. On his diligence and correctness the public, in great measure, rely for true reports of the news of the day. The person, then, who uses his name to procure success to a speculating project or to give currency to a mere joke, acts a part highly culpable and injurious.

With very grateful acknowledgment we mention our obligations to Mr. Topliff, to whose obliging communications our paper owes much of what interest it may possess.

A man thus indorsed would not, of course, long remain in another's pay. The following year Mr. Topliff became himself proprietor of the reading room and by his marked ability in its conduct developed a business very satisfactory to the merchants and very remunerative to himself. Under him headquarters were soon removed to the Merchants Hall building, on the corner of Congress and Water streets, an admirable site for the reason that the postoffice was then in that same building.

Examination of the old newspaper files of the period shows that from this time on it was quite the custom to head items of foreign intelligence "from Mr. Topliff's correspondent" at Gibraltar or Smyrna, or some other distant point. Apparently a large part of the foreign news came through his correspondents. He may thus be said to have been the forerunner of The Associated Press in New England.

The nearest approach to the telegraph that the times permitted was introduced by Mr. Topliff for the improvement of his service. The Columbian Sentinel of August 5, 1820, thus chronicles this forward step:

The subscribers are informed that a signal staff has been erected on the east head of Long island, the expense of which has been defrayed out of the funds of this establishment. The site is judged to be the best for the purpose of any in the harbor.

Balls have been substituted for flags. They are all painted black, and are six feet in diameter. The staff is 92 feet from the ground to the head of the topmast, and the yard from which the balls will be suspended is 30 feet in length and is 62 feet from the ground.

Mr. Lawrence, the keeper of the lighthouse, is employed to attend to the staff, which is now in operation. Mr. Lawrence, on being furnished a duplicate of the private signals of shipowners in this place, will display them on the approach of their vessels into the bay for a small fee, and he has authorized the subscriber to make arrangements with such gentlemen as wish to have their signals so displayed. The topmast is reserved for the present for that purpose.

Samuel Topliff.

Topliff's newsroom was a kind of club as well as an information bureau. It was the headquarters for the merchants who dropped in regularly in the morning before proceeding to their counting rooms and offices. Besides the "telegraph" it maintained two boats, from which Mr. Topliff or his assistant boarded incoming vessels in quest of the latest marine news. The facts thus obtained were recorded for the benefit of subscribers in one of seven books, each devoted to some branch of the subject.

Because he had been obliged to support his mother and young brothers, Mr. Topliff did not marry until he was forty, and it is to the period of his early married life that the house formerly on Fort Hill, with its telescope and its stuffed animal room, belongs. By the time he came to live there the newsroom was in the old State House, where it remained until Topliff's connection with it ceased.

A telegraph system will shortly be completed in the French African colonies, enabling communication to be established with the most distant posts. The government of French West Africa is erecting a line connecting Timbuctoo with Zinder, thus putting the basins of the Niger and Tchad in communication with the coast. That government, in conjunction with that of Algeria, has, it is stated, under consideration a line connecting North and Central Africa, which will, in effect, duplicate the submarine cable from Brest to Daken.

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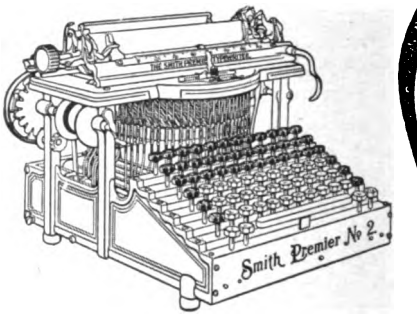
Smith Premier Typewriter



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The Telegraph Chronicle

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SEPTEMBER 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

An Important Question Considered.

A correspondent writes to Telegraph Age as follows:

As a reader, interested as he thinks one should be, will you kindly allow me to comment upon some of the remarks made by some who have advanced from positions as third-class operators, to those of responsibility.

The general opinion among officials is that the common, every-day operator does not use that effort so essential to promotion. But how they arrive at such conclusions is beyond the comprehension of many of us. To take the stand that any one, or even fifty per cent. of the men in the ranks, can, if he makes proper effort, become a first-class operator, to say nothing of rising to positions of responsibility, is incorrect, for by lining up this class of men on any organized or unorganized road we readily see that not one-half of them can ever be anything but very poor senders or receivers, or both. I think it hardly probable become sufficiently expert to attract favorable attention from superiors, regardless of other qualifications, educational and otherwise.

As this is only a personal letter between you and me, please let me refer to my own situation as an index to the (supposed) condition of others. My experience has been too brief to speak as I am, perhaps. I did not commence the work at the age of fifteen or sixteen, as all of the really successful operators are supposed to have done. My father and mother taught all their lives in two, three or four-room village schools, so I, when eighteen, with some special training but not even a high school education, began teaching in country schools. After two years of such work I was selected as principal of a six-room city school. For three years, until I was twenty-one, this course was followed, all spare hours in winter being spent in study, and summer months at state normal school, which qualified me amply to draw the magnificent salary of sixty dollars per month. I had a fair knowledge of bookkeeping, and at different times taught penmanship in a business college.

At this time, my health having failed, I tried telegraphy for my health, and secured a position as agent-operator after nine months' close application. Putting it modestly, one might say my sending is merely bad, though my receiving is above the average, experience considered.

How is such an operator to reach a place where he will be interested in quads, volts, et cetera, is the all-important question? And I've tried to improve, too. Seventy-five per cent. of our men are no better than I am, some being better senders but even poorer in other work. I've held agencies that paid $85, and can easily hold such a position, but my desire is to become a first-class operator, and in that way finally get a college education.

It's up to us. Can we still be optimistic? I think not—there is nothing to promote such a mental condition.

A man endowed with the evident intelligence and possessing the experience our correspondent claims to have had, should be able to take a broader gauged view of the subject and situation which engages his attention. He does not appear to have allowed himself to get into proper relationship with the problem of life with which individually he is confronted. He has permitted his mind to become jaundiced, hence does not see clearly, and in consequence does not reason properly. He should cultivate a spirit of optimism which he is inclined to regard as impossible under the circumstances; he should get out of the ruts. Yet for our correspondent, who in varying shade and degree is representative of a type which he himself admits exists in the telegraph service (and they abound in every walk of life), we have abundant sympathy, because so many fail to grasp, either through lack of force of character, or, strangely enough, because of careless indifference, the vital necessities incident to their positions.

The Bible says that men are rewarded according to their talents. This being so, not all engaged in the telegraph service will rise to the office of president. But it should not be forgotten that there are plenty of minor positions, attended by responsibility and carrying fair salary compensation, that are open to and within the reach of any qualified and aspiring individual. Our information is that it is difficult to find men to fill these places. The reason may readily be

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found; men have not demonstrated their competency to fill them. This proves the "general opinion among officials" complained of by our correspondent, that the average operator does not exert proper effort to fit himself for promotion. The business of a great telegraph company, as of any other, is not and cannot successfully be conducted other than on strict business principles. It becomes absolutely essential that individuals in the telegraph service if they desire promotion must fit themselves for it. There is no dodging this proposition; in its application it is a steadfast and eternal rule as old as mankind itself; involved in it is the very essence of civilization and because of it the race has lifted itself out of barbarism and reached the estate it now holds. This is a fact so self-evident that it is marvelous that men are to be found who do not recognize it, or refuse to accept its personal application.

It is not every man who possesses the innate qualities enabling him to become a first-class operator and sequentially a first-class chief, and so on; or who possesses executive abilities sufficient to fill positions calling for the exercise of such attributes. One deficient in these respects has made a mistake in entering the telegraph service, and is committing a worse one by remaining in it. We suspect that our correspondent became identified with telegraphy too late in life to ever permit him to become a really efficient operator. For it is a fact that first-class operating talent is evolved and developed only out of the formulative period of youth. It may be laid down as a rule that a man who has passed the age of twenty or twenty-five years can but seldom successfully learn telegraphy. At the latter age he should, indeed, if he be ambitious, be prepared rather to quit the dots and dashes for something higher up, either in the telegraph service or out of it. It should be the aim, as it is the duty, of every man who possesses discriminating intelligence, to conscientiously determine, sooner or later as it may be possible, what is the best course in life for him to pursue. This should be his guiding principle early in life, helped by observation, study and painstaking effort, while free from the responsibilities of family cares. On general principles, if the factor of health remains unimpaired, we affirm that every person—at least those who show themselves sufficiently intelligent to enter the field of telegraphy, can better their worldly condition to some extent. Not only this, but also as a rule, responsibility for position rests wholly with the individual. Let none delude themselves with the idea that telegraph officials are not constantly on the lookout for competent men to fill the higher position in that business. They are; and it is a false, weak and silly theory to hold to the contrary. The age in which we live, as never before, demands men with technical education. In some degree, at least, in whatever field of endeavor one may be placed, a practical—a technical knowledge of the business is essential to success.

Two-Dollar Subscription Rate Commended.

We are in receipt of a number of letters commending our course in advancing the subscription price of Telegraph Age from $1.50 to $2.00 a year. We select from the correspondence a communication received from George W. Deetz, manager of the Western Union office at Atlantic City, N. J., who writes in this complimentary vein:

"These are busy days at the "Greatest Resort in the World," yet time is taken nevertheless to at least glance through the columns of your valuable paper. I have never said a good or kind word to you direct, but let me assure you of my appreciation of the many valuable points Telegraph Age has brought me. I have only one objection to your announcement and that is your article on the price to be of Telegraph Age is entirely too long. You could say it all in a few words. Here's a standing order: Continue Telegraph Age to me without questioning at any price not exceeding $5.00 per year. If you exceed this amount, I will consider the matter further."

Telegraphic Visiting Cards.

The Roumanian telegraph administration is congratulating itself on the financial success of a new scheme, the so-called telegraphic visiting cards. These are inland telegrams which contain the address, the name of the sender and nothing else. They take the place of the congratulatory cards that are obligatory on New Year's Day and similar festive occasions. They are accounted good form and have the additional merit of being exceedingly simple, the sender not having to think about the phrasing suitable to the rank and condition of the receiver. How popular telegraphic visiting cards have become may be gauged by the fact that during the fiscal year just expired no fewer than 322,000 of these messages have passed over the Roumanian state telegraph system.

The International Technical Congress, which has the support of the telegraph and telephone engineers of Europe, will hold its first session on September 21, meeting at Budapest, Hungary. Governmental delegates, so far as announced, will be present from England, France, Germany, Bavaria, Austria, Italy, Belgium, Holland, Denmark, Sweden, Roumania, Bulgaria and Servia. Information may be obtained from Endre Kolossvary, chief of the technical department, Direction Générale des Postes et des Télégraphes, II. Albrecht ut 3, Budapest, Hungary.

To-morrow will be the yesterday of the day before—do it now.

It doesn't make any difference to the general public whether you win or lose. Therefore, it is up to you!

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The Military Telegrapher in the Civil War.

PART EIGHT.

The campaign in Missouri early in the Civil War afforded many opportunities for the nice exercise of the abilities of the military telegrapher. Here, as elsewhere, he contributed to the general welfare not only in professional services rendered, but exhibited evidences of patriotism and soldier-like qualities by instances of personal bravery, sharing the lot under fire, of the rank and file of the army in the defense of his country. Missouri being a border state, with a population having affiliations with both the North and South, its territory, particularly in the southern portion, became the scene of almost constant skirmish and guerrilla warfare until the line of battle was pushed further south. With neighbor oftentimes arrayed against neighbor, a spirit of personal bitterness, always the most vindicative under such circumstances, frequently characterized the operations of the opposing forces. The city of Springfield, situated in Greene County, in the southwestern part of the state, a point of strategical importance, became an established headquarters of the Union army. It was a center about which much desultory fighting, besides several heavy engagements, took place, and where the cutting of telegraph wires was of constant occurrence.

W. H. Woodring, an engraving of whom appears elsewhere in this issue, a telegraph operator, at that time twenty years of age, was an actor in the military events of 1861-63, transpiring in the vicinity of Springfield and other sections of the state, and subsequently elsewhere. In a letter addressed to Colonel William R. Plum, the historian of the military telegraphers, written from Kansas City, Mo., in October, 1878, he refers to the incidents of his career as a military telegrapher, in substance as follows:

"When the war broke out in the spring of 1861, I was the single operator in charge of the Rock Island, Ill., telegraph office. There was but one wire at that time, and over this all of the railroad and commercial business was transmitted, besides what press reports there were for the two daily papers. On May 3 I resigned and enlisted as a private soldier. The fact, however, that I was a telegraph operator caused much of the official telegraphing to be entrusted to me. Our regiment was soon sent to Rolla, Missouri, the then terminus of the Pacific railroad, along which no telegraph line had been built. In October we started on a long march to join General John C. Fremont's forces at Springfield, the line of march following the old Stebbins telegraph line, which before the war was operated via Sedalia, and southward along the old stage road to Springfield. The retreating rebels had pulled the wire down in many places and carried away the instruments from all the offices. Only a Grove battery was left at Springfield. Returning to Rolla the following month the regiment went into camp at that point for the winter. In the meantime the Government had built a telegraph wire to Rolla, at which place a Mr. Rugg was in charge of the office. I was able to be of considerable assistance to him because of my knowledge of batteries. I was urged to join the military telegraph corps by the chief operator, J. C. ("Yankee") Sullivan, who was stationed at St. Louis, for the reason that the Government had need of my services as an operator.

"Finally, through the influence of a letter, dated at Chicago, January 29, 1862, written by my old superintendent, E. D. L. Sweet, and to Thomas T. Eckert, superintendent of military telegraph at Washington, backed by the subsequent request of Captain George H. Smith, superintendent of military telegraph of the department in which I then was, conveyed through my regimental captain to Major-General Halleck, commanding the department, I was detailed for transfer to the telegraph corps. My first order from Captain Smith was to take charge of the telegraph office at Lebanon, Mo. The telegraph wire from Lebanon to Springfield was in bad shape, and needed constant repair, entailing much hard work on the part of the repairers. Not long after reaching Lebanon, and at a time when all of the repairers were absent, engaged at the southward in construction work, I essayed to mend a break myself about three miles out. The wire had parted at the insulator, which was fastened to a tree. I had no tools and no wire, but finally, under circumstances the most adverse, I managed to make a splice which, if not artistic, at any rate served for the time being. A few weeks later the foreman of repairs passing that way cut out the splice and brought it with him to the office, exhibiting it as a curiosity. I mention this incident to illustrate the conditions under which frequently we were obliged to labor. After a short leave of absence in May, 1862, I reported at St. Louis for duty. I was ordered to proceed to Springfield, Mo., and there take charge of the telegraph office. I made the journey from Rolla on horseback, and when nearing Springfield, in company with some repairers whom I had overtaken, and in whose wagon I was riding, leading my horse, we had a narrow escape from capture, a party of bushwackers, so we were informed, crossing the road at a point around a bend almost immediately after we had passed along.

"Shortly after my arrival in Springfield, Brigadier General E. B. Brown was assigned to the command of the post, and opened his headquarters in a private house, the property of a secessionist, and gave me part of a large room on the first floor for my office. The work here was pretty heavy, and often required us to keep open late at night. General Brown granted me many favors, detailing operators from regiments stationed there to assist me; also furnishing me daily with a mounted orderly to deliver my telegrams. J. B. Morgan was my first assistant. He was a member of the Fourth Iowa Infantry, wounded at the Battle of

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Pea Ridge, and at that time a convalescent. He had helped my predecessor (George H. Peck), and remained with me until near the close of June, when he was ordered to take charge of the Waynesville, Mo., office. There were no other soldier operators available for some time, so Captain Smith sent Cassius M. Barnes, a young civilian, to help me. In the fall of 1862, General Schofield made Springfield his headquarters for some time, while concentrating troops for a forward movement. One of the members of his staff, Lucien E. Barnes, brother to Cassius, also an operator, would frequently help me a little. Charles A. Paxson accompanied General Schofield on this expedition as his private operator. Of Charley it may be said that he had his pocket relay, and pocket —— something else, always with him ready for use. Just before the departure of General Schofield with his force, I learned that there was a pretty fair operator named Harry G. Briggs in the Ninety-ninth Illinois Infantry, then stationed at Springfield. General Brown detailed him to assist me, and Barnes went back to St. Louis. Briggs was a steady man and a pleasant companion.

"On January 7, 1863, we got word early in the day that a force of about 3,000 rebels under General Marmaduke were marching on Springfield, from the southwest, and would reach there probably next morning. Our cavalry skirmished with them that night to delay their approach, as we were very poorly prepared to receive them, all the spare troops having accompanied General Herron a short time before. However, we made ready as best we could to meet the attack. Early in the evening my communication on the wire was suddenly interrupted both east and south. The rebel scouts had cut the wires both sides of us to prevent our communicating with outside forces. The night was clear, with a bright moon shining, and, realizing the great necessity of re-establishing the circuit before the attack, I called up my two repairers and had them mount that night, go forth and try and mend the break. Owen Monday, a splendid man, with plenty of real Irish pluck in him, mounted his big "Claybank" and went east, and "Bob" Bates, on a spirited little mare, went south. Monday found and repaired the line where the rebels had cut it, about seven miles east, and returned without being discovered before daylight. Bates had to go a longer distance, and did not find the break until near morning. Stopping at a farm house to rest and get some breakfast, he did not return until after the rebels had begun their attack. Bates did not know anything of their presence until he rode right into a squad of them at the outskirts of the town. As he was dressed in citizens' clothes, no attempt was made to molest him, yet as soon as he comprehended the situation he put spurs to his little mare, making directly for a cover of trees and brush that skirted the road. The rebels fired a volley after him, but fortunately without effect, and he made his way through the brush into the city.

"Our communication being thus re-established, we were enabled to keep the department headquarters informed of how it fared with us during that entire day, my wire being connected by a loop from the general office at St. Louis with department headquarters. I could not remain idle in my office, however, while the fighting was going on within a couple of squares of it. Briggs and myself had each provided ourselves with a good Enfield rifle and plenty of ammunition. He took his place among the volunteer skirmishers and I wherever I could be of service, part of the time as aid to General Brown, and part of the time firing from behind whatever shelter I could find. At one time while looking over the parapet of our little fort for a shot, I drew the fire of a number of concealed rebels, their balls cutting very close to my ears. At intervals of about one hour I would run to my office and report to St. Louis how the battle was going. The side of the house where my office was received a number of bullet holes that afternoon, and just after dark, as I was lighting my lamp to report that our general was severely wounded, there came a sudden crash, and the room was filled with flying splinters and powdered plastering. Before I could comprehend what was the matter, I saw a dark ball rolling on the floor right at my feet. It was a shell just from the enemy's artillery. Greatly startled, I jumped back and crouched down in a corner, awaiting its expected explosion. Happily for me, the fuse had not ignited and the explosion did not occur. The shell had passed through a wooden church and through three partitions of our building before reaching my office, and then struck the brick chimney and fell to the floor. I hurriedly cut out, taking my relay with me, and went to a building facing Market Square, where my office had originally been before moving into General Brown's headquarters, and where my main battery was still located. There I connected my relay and made my report to St. Louis. This house had been pierced full of loop holes for defensive purposes, and the wind was blowing through it very cold. We only had one stove and around this was gathered a crowd of shivering soldiers. The firing uptown ceased about eight o'clock at night, and all was quiet until about one o'clock, when our gunners threw a few shells to feel the enemy's position. It created considerable excitement in my office retreat, for we supposed the fight was being renewed. I reported the firing to St. Louis, and then my wire was cut again east, the rebels having quietly withdrawn and retreated along the Rolla road, cutting the wire in many places and stringing it across the road behind them. I had not heard a word from Briggs since about two o'clock on the 8th inst., so I sallied forth early the next morning to search for him. Soon I met an officer, who informed me that poor Briggs had been killed, and told me where his body lay. Sorrowfully I hurried to the place, not far from my office, and there, on the back porch of a house, lay his body, a bullet having pierced one of his eyes."

(To be continued.)

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A Telegrapher's View of the Telegraph.

EDITOR TELEGRAPH AGE:

I approve of the view expressed by Telegraph Age respecting the question of placing the filing time on all telegraph messages. If the sender of a telegram desires the time of its filing to be incorporated in a message, in my judgment, he should pay for it. I fail to see the justice of imposing the trouble and expense of such inclusion on the telegraph company.

I observe the communication by Romyn Hitchcock in the August 16 number of Telegraph Age, on the "Filing Time on Messages." I take issue with your correspondent, for what he writes is, unfortunately, much in line with other arguments of that nature, the tendency of which is to convey a wrong idea. Certainly Mr. Hitchcock must be aware that out of at least one dozen messages, for instance, handled daily between New York and Philadelphia, of which number there are a few that will show five minutes service, while in those that do not the delay can readily be explained.

I recently met a first class telegraph operator whom you know. He insisted on demonstrating to me that out of every twenty-five-cent message sent the telegraph companies realized a profit of eighteen cents. It was not my business to correct him; in fact, I did not have the time to bother with him; to argue with a man who should have known better to advance such a statement was a needless waste of time. I instance the case, however, to illustrate the too frequent and entirely erroneous criticism one is apt to hear nowadays respecting the telegraph.

As an old telegraph man, one having practical knowledge of the general subject of telegraphy, I believe the companies are wholly justified in viewing the filing time question as they do, and that Telegraph Age has also taken the right stand in this matter. Not only this, but I believe that the address and signature in all messages should be included among the counted words and paid for by the sender. This is in accordance with justice, for as a matter of fact, the telegraph companies cannot afford to transmit messages at the present low rates of toll. Some action is necessary to increase present revenues. Despite what criticism may instance, I affirm that at least ninety per cent. of the business handled shows that the telegraph is rendering a prompt and reliable service. Why should the telegraph companies get a revenue only from the "words in the body of the message?" There is no more reason why a charge should not be made for everything written on a blank than that the butcher should not charge for the bone in the steak. The telegraph and those that work conscientiously for its interests have nothing to keep from the public.

We see it stated that employes of many different lines of railroad are interesting themselves in acquainting business men with the fact that if the rates on freight are not increased wages of employes must be reduced. The telegraph companies are in a like position; the expense of labor remains about the same, while all kinds of material has advanced in price more than fifty per cent., without any corresponding increase in revenue.

No more fitting word can be employed to express my meaning than to say that the "laborer is worthy of his hire," and surely the telegraph is a laborer in behalf of the people. Few understand the real conditions under which the telegraph is administered.

A TELEGRAPHER.

Detroit, Mich., August 22, 1908.

Wire Direct from Crude Copper.

By the invention of Sherard Cowper-Coles it has become possible to produce copper wire in one operation from crude copper, such as Bessemerized copper bars. The copper is deposited electrically on a revolving mandrel or drum rotated at a critical speed which gives the most dense, tough and smooth deposit. This speed may be found experimentally by rotating a cone-shaped cathode for a time while the electro-deposition of the copper is going on and then determining the region of the finest deposit.

An explanation of the process is that each molecule of copper as deposited is burnished by the friction of the electrolyte. This would be expected to insure a very homogeneous metal, and it is declared that the result obtained is actually more regular than can be obtained by applying great pressure to a large mass in the way of rolling, drawing or hammering.

As the copper so deposited crystallizes at right angles to the surface upon which it is formed, a spiral V-shaped scratch is made on the mandrel, along which the crystals form a weak line of cleavage. No line of cleavage is produced if the base of the scratch is rounded, as the crystals would then form radially. It is said that four or five miles of wire may be made on a single mandrel. The strip has only to be unwound, separating along its natural line of cleavage and passed through a set of dies which remove the burr or fin and form a round section.

The copper produced by this method is explained to be very dense and to possess a considerably higher tensile strength than possible with the usual methods of annealing and drawing or rolling.—Western Electrician.

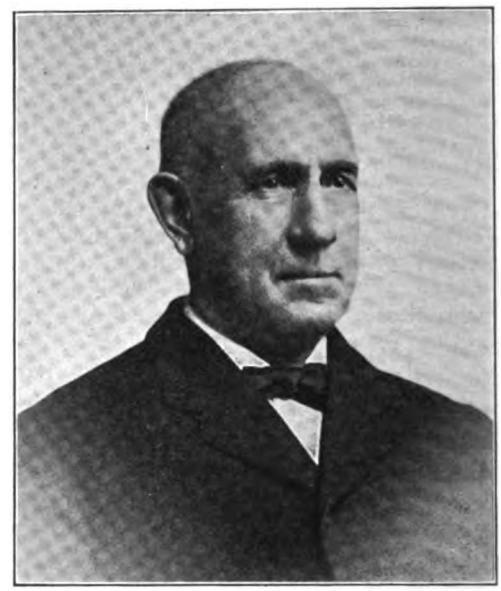
Mr. W. M. Martin, manager of the Western Union Telegraph Company, at Burlington, Vt., evidently has abundant faith in Telegraph Age, considering it to be a good proposition in which to invest. His subscription to this publication is paid in advance to cover the years up to and including 1916, a date far in advance of any other paid up subscription.

If you wish to know all about the instruments you work, invest $1.50 in a copy of Jones' diagrams.

The Reunion of the Old-Time Telegraphers' and Historical Association and of the Society of the United States Military Telegraph Corps.

It was a distinct disappointment to the membership that the regular annual joint reunion of the Old Time Telegraphers' and Historical Association and the Society of the United States Military Telegraph Corps, announced to meet last year at Niagara Falls, N. Y., was not held. The then prevailing disquiet in telegraphic circles made omission of the meeting a necessity under the circumstances. The reunion this year, however, the twenty-seventh in the series, at the same place, to be held on Wednesday, Thursday and Friday, September 16, 17 and 18, with headquarters to be established at the Cataract and International Hotels, a superior hostelry conducted under a single management, promises to be a fine affair. This will be true, particularly in regard to the military telegraphers, who aim to make this an especially notable event, for it is announced that among those to be present are Colonel Robert C. Clowry, president and general manager of the Western Union Telegraph Company; Colonel William R. Plum, the historian of the military

HARVEY D. REYNOLDS, BUFFALO, N. Y.
President, Old Time Telegraphers' and Historical Association.



G. A. BURNETT, BUFFALO, N. Y.
Vice-President, Old Time Telegraphers' and Historical Association.

I. McMICHAEL, TORONTO, ONT.
Vice-President, Old Time Telegraphers' and Historical Association.

GEORGE F. MACDONALD, OTTAWA, ONT.
Vice-President, Old Time Telegraphers' and Historical Association.

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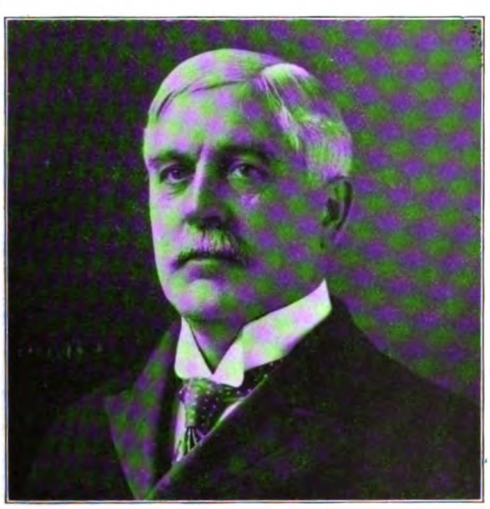
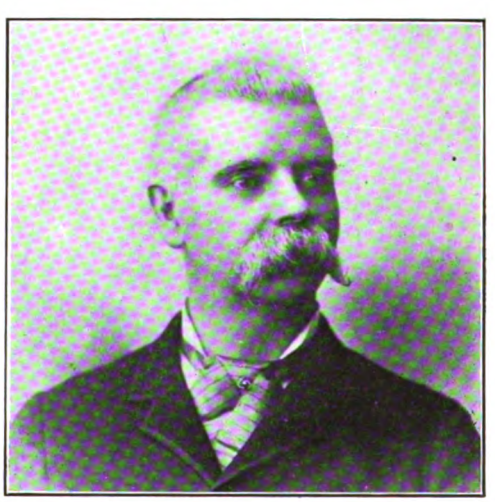
telegraphers; Charles A. Tinker, formerly general superintendent of the Eastern division of the Western Union; Colonel William B. Wilson, president of the society; David Homer Bates, the secretary, and Colonel Albert B. Chandler, chairman of the board of directors of the Postal Telegraph-Cable Company. All of those named had enviable war records, holding positions of much responsibility, the character of which is well known to readers of Telegraph Age. Their meeting together on so auspicious an occasion as that of the reunion, when it is hoped many others, who also served with conspicuous fidelity and ability in promoting the cause of the Union in the department of its field telegraphy, will be present to meet these leaders in social fraternization.

ANDREW CARNEGIE, NEW YORK.
Founder of the United States Military Telegraph Corps.

COL. WM. B. WILSON, HOLMESBURG, PHILADELPHIA.
President of the Society of the United States Military Telegraph Corps.



DAVID HOMER BATES, NEW YORK.
Secretary and Treasurer of the Society of the United States Military Telegraph Corps.



JAMES E. PETTIT, CHICAGO, ILL.
Secretary-Treasurer for twenty-six years, until 1908, of the United States Military Telegraph Corps.

Profound regret will be felt at the death of John Brant, for many years the secretary and treasurer of the Old Time Telegraphers' and Historical Association, who passed away at his home in Brooklyn, August 26, after a lingering illness. He was indefatigable in his efforts to promote the welfare of the association, and as a man and officer was held in high esteem.

Another death, that of William Hamilton Young, of Washington, which occurred June 19, at Chicago, and under whose presidency the Old Timers met at Washington, in October, 1906, the highly enjoyable and well remembered last meeting held, marks another sad break in the telegraphic ranks.

Still another is to be added to the death roll this year. George H. Corse, of Ogden, Utah,

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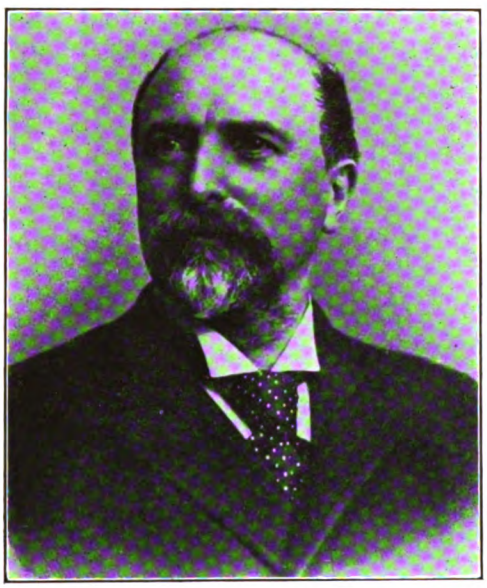
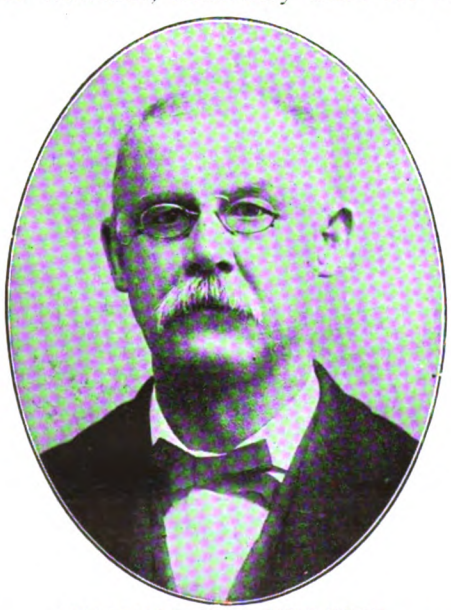
who was president of the Old Time Telegraphers' and Historical Association in 1902, when the reunion was held at Salt Lake City, died after a long and severe illness on August 26.

From official rank in the military corps,



COL. ROBERT C. CLOWRY, NEW YORK.
Member Executive Committee of the Society of the United States Military Telegraph Corps.

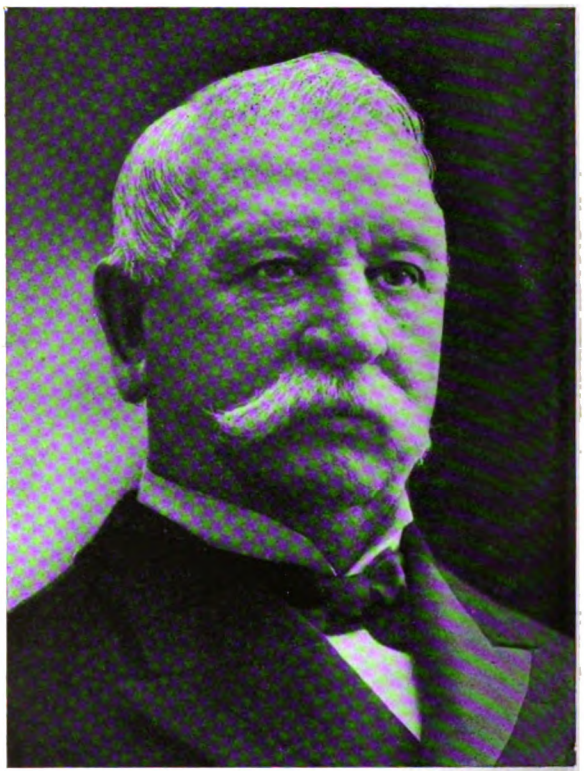
James E. Pettit, of Chicago, has retired because of failing health, which rendered it necessary for him to seek rest, relieved from all business cares. His position of secretary and treasurer, honorably filled for twenty-



WILLIAM L. IVES, NEW YORK.
Vice-President of the Society of the United States Military Telegraph Corps.

six years, has been conferred upon David Homer Bates, of New York, one of the best known of former telegraphers in the United States.

It is planned this year to carry out the program originally contemplated for last year's entertainment. This, in brief, for the dates of Wednesday and Thursday, the order for Friday not yet being announced, provides for the holding of a business meeting of the United States Military Telegraph



GEN. THOMAS T. ECKERT, NEW YORK.
Dean of the Society of the United States Military Telegraph Corps.

Corps at the hotel headquarters at ten o'clock on the morning of Wednesday, Sept. 16, to be followed at one o'clock by a similar meeting of the Old Time

WILLIAM R. PLUM, LOMBARD, ILL.
Historian of the Society of the United States Military Telegraph Corps.

Telegraphers. In the afternoon the noted power plant at Niagara Falls will be inspected, and a visit made to the manufactory of the Natural Food Company, where a "demonstrative" lunch will be served. In the evening a reception will be held in the ballroom of the hotel. On Thurs-

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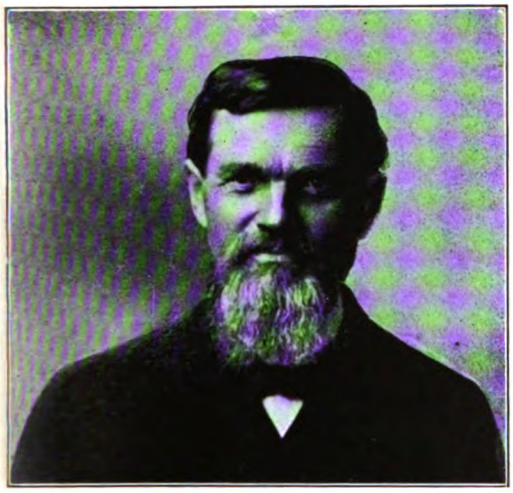
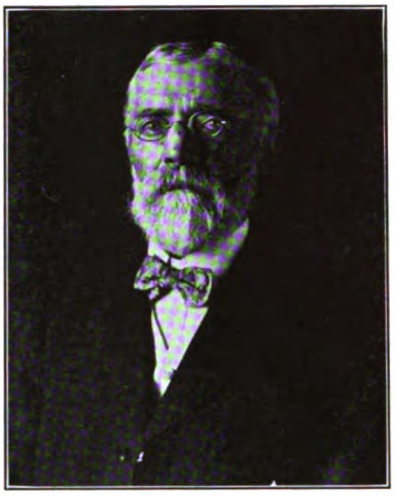
Well Known Military Telegraphers Sketches of Most of Whom Have Appeared Previously in Telegraph Age.



JOHN F. LUDWIG,
Putenney, Ariz.



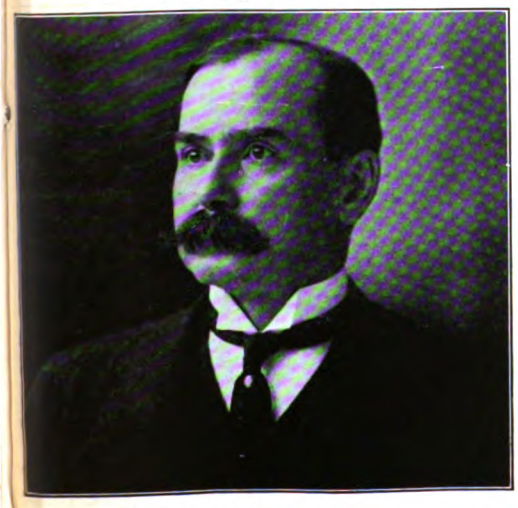
GEORGE F. THODE,
Blakesburg, Iowa.

STEPHEN E. BARTON,
Boston, Mass.

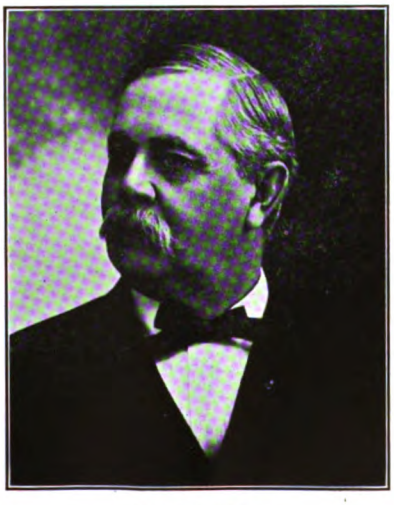
JOSHUA M. SPENCER,
Rising Sun, Ind.

JOHN E. JAYNE,
De Witt, Mich.

ALBERT W. ORTON,
Rome, N. Y.



THOMAS E. CLARKE,
Scranton, Pa.



L. A. ROSE,
Davenport, Iowa.

JOSEPH H. LAFAYE,
New Orleans, La.

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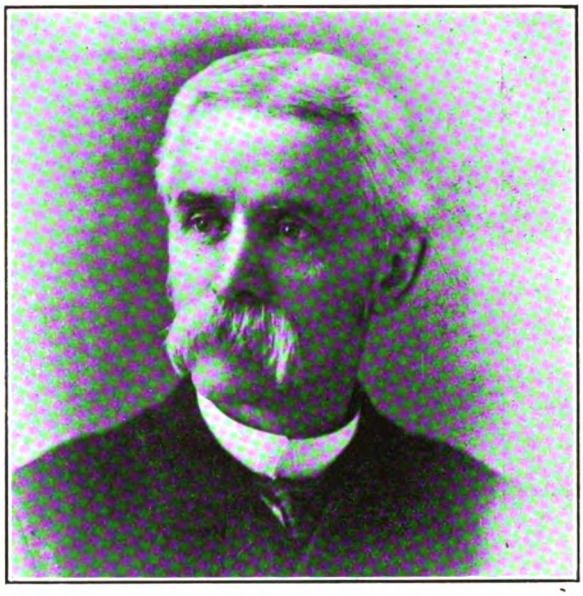
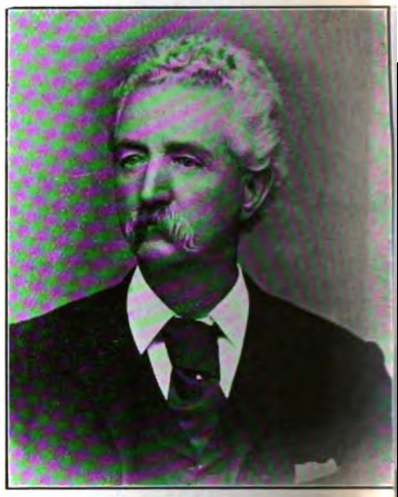
Well Known Military Telegraphers Sketches of Most of Whom Have Appeared Previously in Telegraph Age.

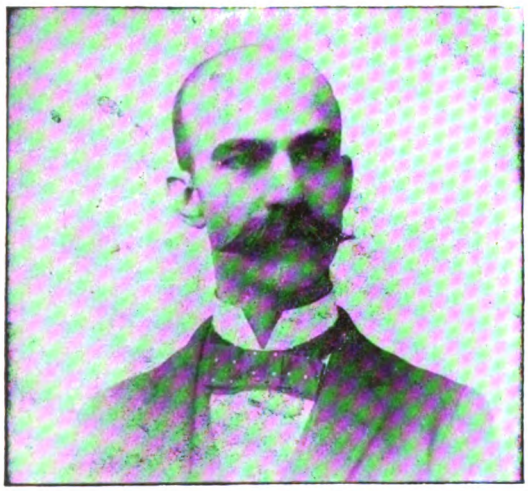
W. S. FORSEY,
Pinole, Calif.



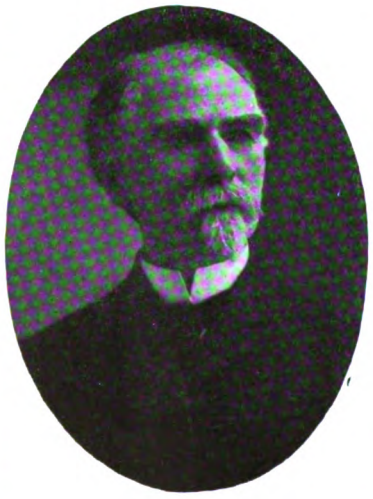
MADISON BUELL,
Buffalo, N. Y.



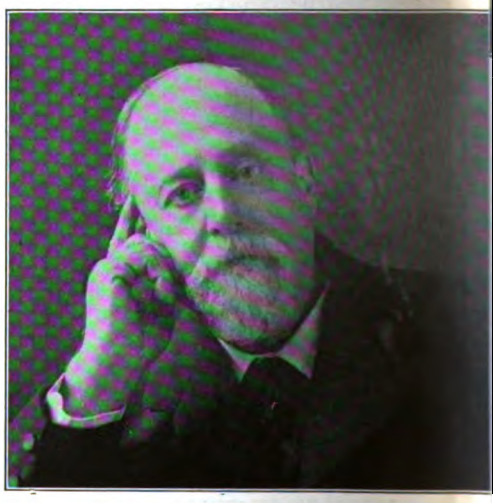
CHARLES H. GRIFFITH,
Modesto, Calif.



RUDOLPH H. BOHLE,
St. Louis, Mo.



W. T. LEWIS,
Racine, Wis.



COL. M. D. CRAIN,
St. Louis, Mo.

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day morning, the 17th inst., the visitors will take a trip over the Niagara Gorge belt line, for which special cars will be provided. This trip will be supplemented in the afternoon by an automobile ride around Goat and Three Sister islands and through the State Reservation Park, while in the evening a banquet will be held at the Cataract

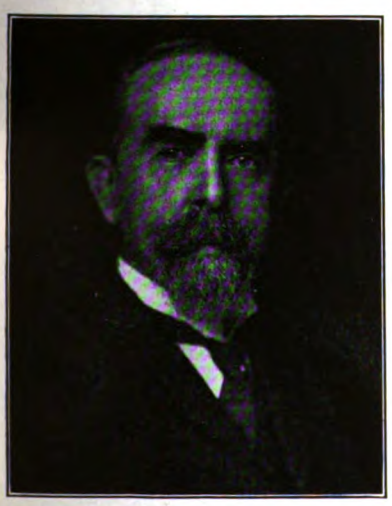
GEORGE C. MAYNARD,
Washington, D. C.
Member United States Military Telegraph Corps.

DANIEL COLESTOCK,
Titusville, Pa.
Member United States Military Telegraph Corps.

WILLIAM J. DEALY,
New York.
Member United States Military Telegraph Corps.

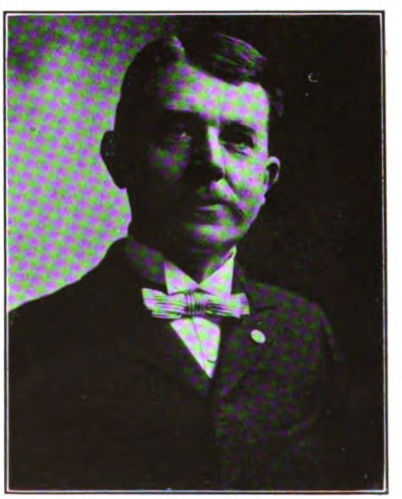
Hotel. Around this board it is expected many people distinguished in telegraph, railroad and other closely allied circles, will assemble. The price has been fixed at one dollar a plate for all attending who are guests of the hotel, the charge for others being two dollars.

The officers of the Society of the United States



RICHARD O'BRIEN,
Scranton, Pa.
Member United States Military Telegraph Corps.

JOHN R. DIXON,
Chicago, Ill.
Member United States Military Telegraph Corps.



WILLIAM H. WOODRING,
Council Bluffs, Iowa.
Member United States Military Telegraph Corps.

Military Telegraph Corps are: Colonel William Bender Wilson, Holmesburg, Philadelphia, president; William L. Ives, New York, vice-president; David Homer Bates, 658 Broadway, New York, secretary and treasurer. The executive committee is made up as follows: Colonel Robert C. Clowry, New York; William R. Plum, Lombard, Ill.; Colonel Albert B. Chandler, Colonel Levi C. Weir and David Homer Bates, New York; Charles A. Tinker, Brooklyn; O. M. Shepard, New Haven, Conn.; John Wintrup, Philadelphia, and Marion H. Kerner, New York.

A special committee appointed by President Wilson to act in conjunction with the president and committee of arrangements of the Old Time Telegraphers' and Historical Association, whose headquarters are at Buffalo, are: George A. Burnett, chairman; Joseph Anderson, Madison Buell, and Thomas A. Laird, Buffalo, N. Y.; James K. Parsons and Harry L. Gregg, Roches-

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ter, N. Y.; Joseph Schnell, Binghamton, N. Y.; George J. Goalding, Erie, Pa., and I. McMichael, Toronto, Ont.

The officers of the Old Time Telegraphers' and Historical Association are: H. D. Reynolds, president, Buffalo; George A. Burnett, vice-president, Buffalo; I. McMichael, vice-president, Toronto, Ont.; George F. Macdonald, vice-president, Ottowa, Ont.; the office of secretary and treasurer being vacant caused by the death of John Brant, of New York.

CHARLES A. TINKER, NEW YORK.
Member Executive Committee of the Society of the United States Military Telegraph Corps.

The names that jointly appear in committees of these two telegraphic organizations show how closely allied both are in their personnel.

Like the Society of the Cincinnati, established in 1783 to perpetuate the friendship of the surviving officers of the Revolutionary Army, the Society of the United States Military Telegraph Corps, has provided means for perpetuating the latter organization by an amendment to the constitution which makes sons and male descendants of original members of the corps eligible to membership. The United States Military Telegraph Corps of the Civil War was organized into a society in 1882, its first reunion taking place at Niagara Falls, in September of that year.

The value of the telegraph as a concrete factor in warfare received full recognition in the War of the Rebellion. The Mexican War was almost contemporary with the first introduction of the telegraph itself, hence in that struggle the telegraph played no part. The Civil War, however, being the first conflict in which this government, or, indeed, any other, became engaged following the confirmed establishment of the telegraph as a means of transmitting intelligence, its utility in such service was conclusively determined. Germany alone of all the nations, had previously acknowledged the worth of the telegraph by adopting it in its military establishment, but its practical use as an auxiliary aid in army movements remained to be decided by the actual test afforded in the vast and active operations extended over the wide area covered by the

J. HERVEY NICHOLS, DENVER, COL.
Member United States Military Telegraph Corps.

MARION H. KERNER, NEW YORK.
Member Executive Committee of the Society of the United States Military Telegraph Corps.

EDWARD W. McKENNA, CHICAGO, ILL.
Member United States Military Telegraph Corps.

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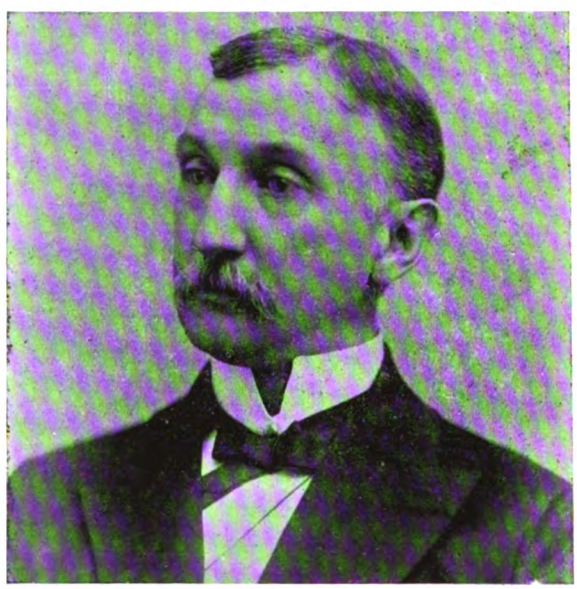
conduct of the internal strife in our own country. And yet with all its potentialities of usefulness its extended adoption was at first slow, and many months passed before an adequate system of military telegraph service to meet the exigencies of the situation was effectively organized. However important, all things considered, this delay

COL. A. B. CHANDLER, NEW YORK.
Member Executive Committee of the Society of the United States Military Telegraph Corps.

COL. JAMES R. GILMORE, CHAMBERSBURG, PA.
Member United States Military Telegraph Corps.

DR. J. EMMETT O'BRIEN, SCRANTON, PA.
Member United States Military Telegraph Corps.



GEORGE J. GOALDING, ERIE, PA.
Member United States Military Telegraph Corps.

may not be strange, for it was owing doubtless to the fact that the government itself at the outset failed utterly to realize the extent and gravity of the war, just then beginning, it had on its hands.

In order to gain a true conception of its network, it is well to fix in the mind to what extent the telegraph had developed and what territory it covered, both in the North and South, at the time the war broke out in the spring of 1861. William R. Plum, in his admirable history, "The Military Telegraph in the Civil War," thus refers to the systems of the telegraph as they existed at the period referred to:

"At the outbreak of the war there were three great private telegraph corporations, two at least vying for supremacy. These three, the American Telegraph Company, the Western Union Telegraph Company and the Southwestern Telegraph Company, unitedly, connected all of the cities, and a great number of towns of the Union, except in the Far West, and even there the Western Union people were busily at work,

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so that before the winter of 1861-62 communication was perfected overland to San Francisco, Cal. The American company's lines occupied that entire region lying east of the Hudson River, and the whole seaboard country along the Atlantic and Gulf, from the island of Newfoundland to New Orleans, with branches extending

H. H. ATWATER, BROOKLYN, N. Y.
Member United States Military Telegraph Corps.

interiorly in the northern states to Albany, N. Y., Pittsburg and Philadelphia, Pa., and Cincinnati, Ohio, at each of which points it met the Western Union company's lines, which occupied chiefly the remaining territory and had its eastern terminus in Rochester, N. Y. In the Southern states, the American company met the Southwestern lines at Chattanooga, Tenn.; Mobile,

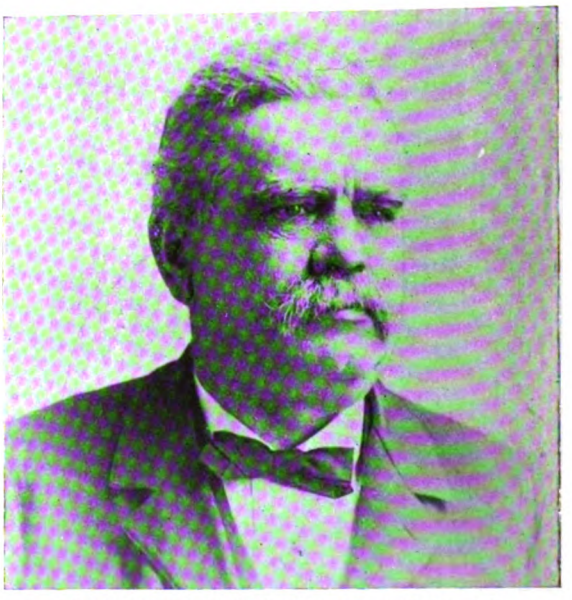
THEODORE E. MORELAND, PITTSBURG, PA.
Member United States Military Telegraph Corps.

Ala., and New Orleans, La., leaving the Southwestern company mainly to occupy the rest of the South and Southwest, including the states of Texas and Arkansas, beyond the Mississippi River. Louisville, Ky., was the headquarters of this company and its most northwesterly point. There were other companies extensive enough for great good, but incapable of long separate existence among such leviathans."

It is interesting to note, as a matter of information, that the government, during the war, undertook in many instances to construct its own lines of telegraph when needed, eventually building and operating, according to Colonel Plum, 15,389 miles of telegraph, which in 1866, after the close of hostilities, was disposed of by sale.

JESSE H. ROBINSON, WASHINGTON, D. C.
Member United States Military Telegraph Corps.

While, as has been said, the importance of the telegraph as an aid to army operations in the field had early received a tentative recognition in mili-



CHARLES W. HAMMOND, ST. LOUIS, MO.
Member United States Military Telegraph Corps.

tary circles, its practical adaptation to war needs was slow in gaining general acceptance. Nevertheless, Simon Cameron, the Secretary of War, was early convinced of its inherent possibilities in the conduct of field operations, and as the railroad obviously was also destined to play a most important part in the transportation of troops, it was natural that he should call to his assistance the most conspicuous railroad man of the day, Colonel Thomas A. Scott, of the Penn-

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sylvania Railroad. In turn Colonel Scott summoned to his aid Andrew Carnegie, a practical telegrapher, and who at that time was the superintendent of the Pittsburg division of the Pennsylvania Railroad. He was placed in charge of the military railroads and telegraphs. The nucleus of the military telegraphers, operators pure and simple, were David Strouse, David Homer Bates, Samuel M. Brown, Richard O'Brien and William B. Wilson, the honored president of the Society of the United States Military Telegraph Corps, a quintette likewise contributed by the Pennsylvania Railroad, and drawn from its telegraph department on telegraphic instructions sent from Washington by Mr. Carnegie.

It would be an interesting recital to trace in full the story of how Thomas T. Eckert, who left the service as a brigadier general, in response to a call from Colonel Scott, became a military telegrapher, first as manager of the telegraph office at General McClellan's headquarters in the

LOUIS H. KORTY, OMAHA, NEB.

fall of 1861; how he became chief of the War Department telegraph staff and superintendent of telegraph lines in the Army of the Potomac, and eventually Assistant Secretary of War; how Mr. Bates was stationed at the War Department, first as operator and later succeeding Mr. Wilson as manager, remaining in the War Department after the close of the war; how subsequently and remaining closely connected throughout the war as cipher operators were associated the "Sacred Three," as they have been familiarly known, Messrs. Bates, Tinker and Chandler; how the famous cipher telegraph system, adopted by the Government, originated by General Anson Stager, received most effective aid in its development and final perfectment by General Eckert, Messrs. Chandler, Bates and Tinker; how the important services rendered by such men as Colonels Robert C. Clowry, John C. Van Duzer, S. G. Lynch, W. L. Gross, James R. Gilmore, Captain Samuel Bruch, and many others of whom it is impossible to mention within the necessarily narrow limits of this article, but of whom it may be said each contributed services of personal valor and value.

The detail of such a history would be replete with charm and delight, but space sufficient cannot be found in these columns. Enough has been stated, even though in brief outline, to afford an appropriate introduction and setting to this special edition devoted in part so largely to the military telegraphers whose meeting in fraternal reunion with the Old Time Telegraphers at Niagara Falls promises to be such a happy event. It is a fortunate circumstance that so many of the actors in the military telegraph are still alive and will contribute by their presence so much to the pleasure of a meeting bound to be memorable.

No body of telegraphers are held in higher esteem than those who in their professional capacity served army interests actively in the field during the Civil War. Their deeds were influenced by motives of patriotism, and furnish many fine examples of intelligent performance, self-abnegation and heroic devotion to the cause in which they were enlisted.

It is unfortunate that the Government has never acknowledged the validity of the claims of the military telegraphers upon the recognition and bounty of this country, so freely bestowed upon the soldier, by whose side the telegrapher acted in a common cause, sharing all perils. The body of the military telegraph corps constituted a secret service, so to speak. It furnished the information frequently that enabled the army to win the battle; its warnings oftentimes averted disaster. This meeting at Niagara Falls will be impressive in all that it represents and stands for.

The various joint committees appointed for the occasion by the Old Time Telegraphers' and Historical Association and the Society of United States Military Telegraph Corps, in addition to a special reception committee to the war veteran telegraphers previously named and specially appointed by President Wilson, are:

Reception Committee.—George A. Burnett, chairman, Great North Western Telegraph Company, Buffalo, N. Y.; Nathaniel Hucker, J. W. Sullivan, John B. Slocum, William A. Sawyer, George F. Macdonald, E. W. Collins, J. W. Tillinghast, John A. Pferd, John Lapey, C. H. Newman, I. McMichael, Charles H. Chevee, Louis J. Reynolds, W. J. Martan, William H. Slacer, H. J. Kinnucan, L. M. More, S. E. Houck, Madison Buell, Thomas A. Laird, Thomas E. Sullivan and Joseph Anderson.

Ladies' Committee.—Mrs. H. D. Reynolds, chairman, Buffalo, N. Y.; Mrs. L. M. More, Mrs. Joseph Anderson, Mrs. C. H. Newman, Miss Carrie D. Reynolds, Mrs. W. A. Sawyer, Mrs. W. L. Stow, Mrs. John A. Pferd, Miss Nellie Kearns, Mrs. George A. Burnett, Mrs. John Lapey and Miss Lillis Harper.

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MILITARY TELEGRAPHERS

Sketches of Whom Have Not Previously Appeared in Telegraph Age.

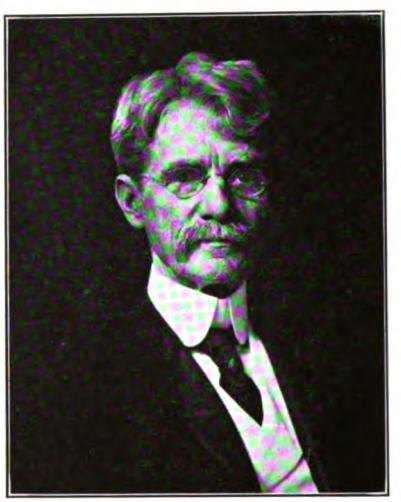
Frank B. Knight.

Frank B. Knight, special agent of the Southwestern Telegraph and Telephone Company, at Dallas, Tex., is a well known former telegrapher. He was born at Canandaigua, N. Y., December 23, 1848, and entered the telegraph service as messenger at Geneva, N. Y., in 1862. In 1863 he entered the United States military telegraphs, finding service first on the Orange and Alexandria Railroad, Virginia, and afterward at Newport News. Sometime before the close of the war he was stationed at Fortress Monroe, as operator for the chief quartermaster of the Army of the James. When the war closed, young Knight found employment with the Western Union Telegraph Company at Rochester, N. Y. Early in 1870 he was appointed chief operator of telegraphs of the Union Pacific Railroad at Omaha, resigning, in 1872, to accept the position of chief operator for the Western Union Telegraph Company at its Omaha office, of which in 1877 he became manager. In May, 1880, he retired to accept the special agency of the American Bell Telephone Company, first in the West and afterward in the Southwest. His present position he has held since 1905.

FRANK B. KNIGHT,
Dallas, Tex.

William Dunlap Sargent.

W. D. Sargent, vice-president and general manager of the New York and New Jersey Telephone Company, Brooklyn, N. Y., is a graduate from the telegraph service. He is a Pennsylvanian, having been born at Ligonier, that state, July 2, 1845. His entry into the telegraph was at Harrisburg, in April, 1860, in the service of the Pennsylvania Railroad Company, afterward becoming manager of the Western Union office at that point. He became an operator in the United States military telegraphs and was stationed at General Burnside's headquarters in Cincinnati. In 1871 he held the position of assistant electrician in the Western Union Telegraph Company at Chicago, subsequently accepting the superintendency of the District Telegraph Company in Philadelphia. This was in 1873. In the fall of 1877, he became identified with the telephone, filling the position of general superintendent at Philadelphia of the Bell Telephone Company. This he held until 1882, when he accepted his present office at Brooklyn.



WILLIAM D. SARGENT,
Brooklyn, N. Y.

Charles William Jaques.

Charles W. Jaques, now engaged in the insurance business and that of dealing in bonds and stocks at Ashtabula, O., is a native of Mansfield, O., where he was born February 9, 1845. It was at this point in July, 1859, that he first entered the telegraph service. His record as a United States military operator dates from May 15, 1861, entering the service at Chain Bridge, above Washington, D. C. He opened the first military telegraph office on Confederate soil at Alexandria, Va., on May 24, 1861. At the time of the first battle of Bull Run he was located at Springfield Station on the Orange and Alexandria Railroad. During all of the time that Generals McClellan and Burnside were in command of the Army of the Potomac, Mr. Jaques was an operator at headquarters in Washington and in the field. When Morgan made his famous raid through Ohio, he served as a cipher operator at General Burnside's headquarters in Cincinnati, and was subsequently at Knoxville during the siege of that place. At this point he was wounded. Later he acted as cipher operator at General Sherman's headquarters at Nash-

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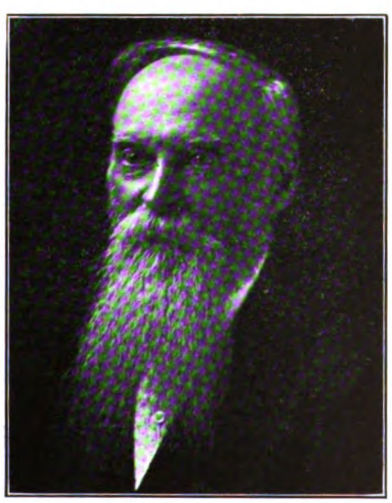
ville, Tenn., and afterward served in the same capacity under Generals McPherson, Logan and Howard in the Atlanta campaign. Mr. Jaques spent four years in the military telegraph service, and when the war closed entered the Western

CHARLES W. JAQUES,
Ashtabula, O.

Union employ for three years at St. Louis, Mobile, Ala., New York and other places, when he left commercial for railroad work, finally quitting that after serving nine years as train despatcher for the Pennsylvania Railroad, and three years as chief train despatcher at Chicago of the Chicago and Northwestern Railroad. He retired from the telegraph service twenty-four years ago.

John Lonergan.

John Lonergan, now a resident of Denver, Colo., had a notable career in the military tele-



JOHN LONERGAN,
Denver, Colo.

graph service. This was referred to at length recently in one of the series of articles now running in Telegraph Age, entitled "The Military Telegrapher in the Civil War." A note from Mr. Lonergan refers to his participation in that service as "one who has traversed the country during the Civil War from the Ohio river to Savannah; from Savannah to the Potomac, and who has seen considerable of what General Sherman termed h—."

Mr. Lonergan was born at Cashel, Ireland, February 14, 1843, and entered the telegraph at Milwaukee, April 10, 1857, as a messenger in the Wisconsin State Telegraph Company. Subsequently he became an operator in the railway service until 1862, when he served as a volunteer in a brief campaign against the Sioux Indians in Minnesota. Entering the military telegraphs in February, 1863, he was engaged for several months in active duty in the Army of the Cumberland. He was with Sheridan's division during the Chickamauga campaign; from October, 1863, to March, 1864, with General Crook, and with the 15th Army Corps until May, 1864. He saw active field service during the Atlanta campaign; from October 10, 1864, until the surrender of General Johnson, he served under General O. O. Howard in the Army of the Tennessee. Following nearly a year's employment by the Western Union Telegraph Company, Mr. Lonergan from May, 1866, to June 30, 1869, had charge of the cipher telegraph for the Department of Tennessee. The next three years was passed in Western Union employ at Nashville, Tenn. From May, 1872, to September, 1899, he acted as the joint agent for the Union Pacific and other roads, and for express interests at Marysville, Kan. At the latter date Mr. Lonergan's health failed him and he was obliged to relinquish all work.

George Washington Standifer.

The subject of this sketch, a military and commercial telegrapher and a farmer withal, died on August 6, 1908, at his home in Athens, Tenn. He

GEORGE W. STANDIFER,
Athens, Tenn.

was a member of the United States Military Telegraph Corps, of which he was justly proud, keeping the framed certificate of membership hanging in his room. His wife, loyal to his memory, sends us the following facts relative to his life.

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George W. Standifer was born in Bledsoe County, Tenn., June 5, 1833. He learned telegraphy when sixteen years of age, and entered the telegraph service at Athens. The family were Union adherents when the Civil War broke out, but the father was conscripted by the Confederate authorities and died in Mississippi in 1862. The subject of this sketch served the Union forces as an expert telegraph operator during the war under General Burnside and other officers, principally in East Tennessee.

After the close of the war Mr. Standifer became an operator for the Western Union Telegraph Company, yet finding much time to devote to the care of his farm. He was a man held in high esteem in the community in which he dwelt, and his passing away aroused many old time war memories and elicited numerous testimonials as to his character.

Thomas H. Brooke.

T. H. Brooke is in the real estate and insurance business at El Reno, Okla. His telegraphic career was a diversified and picturesque one. He was born in 1844, in Preston County, W. Va. During the years 1861-62 he was in the railroad service in his native state, and afterward in Ohio. In March, 1863, he entered the United States Military Telegraph service under Captain Samuel Bruch. He was stationed at Columbia, Ky., until routed by the Morgan raid in July, 1863, when he was transferred to a position under Colonel J. C. Van Duzer. He was captured at Fostersville, Tenn., in November, 1863, by General Joe Wheeler, who paroled him as a prisoner of war. Returning to West Virginia he was engaged in special service at various points of attack on the line of the Baltimore and Ohio Railway, and was in battle with Generals Crook, Averell and Lew Wallace. Six months prior to the close of the war he was employed first in the Baltimore office and then in Washington under Assistant Manager W. H. Young, of pleasant memory and lately deceased. The war over Mr. Brooke went to Denver, Colo., but returning to Nebraska entered the railway telegraph service in which he remained there and in Oklahoma Territory until 1898, when he engaged in the furniture business at Anadarko, Okla., which he conducted for five years, when he was burned out.

THOMAS H. BROOKE,
El Reno, Okla.

Robert Moses Talbot.

R. M. Talbot, now living in retirement at Cleveland, O., has had a fine record as a commercial railroad and military telegrapher. He is a native of Claridon, O., his date of birth being March 5, 1841. He became identified with the telegraph in the railroad service at Willoughby, O., in 1852.

Mr. Talbot began his war services in June of 1861. At that time he served at Major General McDowell's headquarters at Arlington House after the first battle of Bull Run. He was with Major General Wright during the Morgan raid, and with Major General Buell in the operations in Kentucky. He also sent despatches for several months for Major General W. S. Rosecrans, commanding the Army of the Cumberland. It was when he was with Rosecrans that he was assigned to Sherman's army in its march to the sea, but was prevented from further service by sudden sickness. He was sent home, where he recovered from his dangerous illness, but he has never known a well day during his life since. For the past ten years he has been paralyzed.

R. M. TALBOT,
Cleveland, O.

During his career Mr. Talbot served as an operator of the Western Union and Pacific and Atlantic telegraph companies, and manager of the Duquesne way oil office at Pittsburg, and manager of the Central Pacific and Atlantic and Pacific companies at Stockton, Cal.

John Willard Freeland.

John W. Freeland, who is now engaged as a traveling salesman for a wallpaper manufacturing concern in Chicago, was born in Virginia in 1846, and entered the telegraph service at Mannington, W. Va., in 1860. He early became iden-

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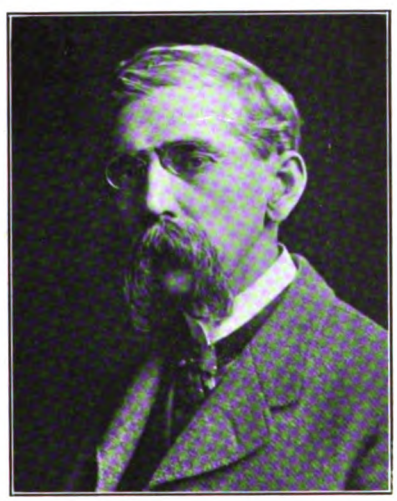
tified with the United States Military Telegraph first with General Kelley in West Virginia and later in Virginia and in Maryland. During this period Mr. Freeland says that he was paid part of the time by the United States, another part of the time by the Baltimore and Ohio Railroad Company, and frequently not at all. He rendered telegraphic assistance in running Indiana soldiers dressed in gray, over the Baltimore and Ohio Railroad and in cars that had previously been used for the transportation of cattle and hogs. When under General Burnside in Ohio, Mr. Freeland was captured at Loveland, that state, by General John Morgan at the time of his raid, but made his escape on the same day. While serving in Missouri he was captured in Platt County, that state, by the notorious guerrilla chieftain Anderson, but managed to escape and found his way back to military telegraph headquarters at Winthrop that same night. It was at this point that Mr. Freeland took charge of the military



JOHN W. FREELAND,
Marion, O.

telegraph office on April 2, 1865, subject to the orders of Captain R. C. Clowry, a post that he retained until the close of the war. While in the military telegraph service in the cold winter of 1863-64 he had his ears, nose and other portions of his face, as well as his feet, frozen, while going from Sandy Hook, Md., to Harper's Ferry, Va.

George Albree Low, Sr.

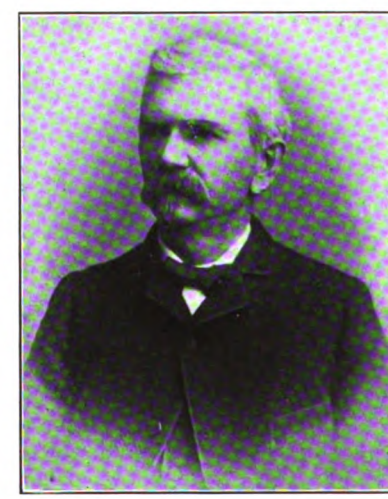
George A. Low, Sr., retired, of Wilkinsburg, Pa., a former telegrapher, is a native of Pittsburg, in which city he was born October 22, 1844. Having learned to telegraph, his first employment as an operator was in the service of the United States Military Telegraph Corps, his entry thereto being September 5, 1861. He was associated all through the war with the "Sacred Three" at the War Department office, Washington, retiring therefrom December 6, 1865. In 1866 he entered the employ of the United States Telegraph Company at Pittsburg. The early subsequent consolidation of this company with the Western Union carried Mr. Low as an asset, but he remained but a short time in the employ of the latter, leaving it to accept the position as passenger conductor on the Pittsburg division of

GEORGE A. LOW, SR.,
Wilkinsburg, Pa.

the Pennsylvania Railroad, which he held for fourteen years. Afterwards as a trusted employe in the Edgar Thomson Steel Works, and with Carnegie Brothers and Company, he passed the following twenty years, thus completing his business career.

William Spinner.

William Spinner, manager of the Western Union Telegraph Company at Eureka, Nev., and who also holds the office of recorder as well as that of ex-officio auditor at that point, of Eureka County, political positions he has filled continuously for the past sixteen years, began his telegraphic career fifty-three years ago as a messenger boy at Paris, Ont. He was born at Utica, N. Y., in October, 1842. In the fall of 1855 he did some work as an operator at Galt, Ont., and



WILLIAM SPINNER,
Eureka, Nev.

later at Komoka, Niagara and St. Catharines. In connection with this early experience, Mr. Spinner refers with evident pride and affection to the now venerable H. P. Dwight, president of

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the Great North Western Telegraph Company. In 1859 young Spinner entered the railway telegraph service at London, Ont., and afterwards at Detroit, thence returning to London. In September, 1861, he joined the United States Military Telegraph Corps and was assigned to service first in Missouri and later in Kansas under the supervision of Colonel R. C. Clowry and others. Resigning from army work in 1863, he went further west, but returned east in 1865 and found employment in the telegraph at Cincinnati and Memphis. In May, 1870, he went to Sacramento, California, and later in the same year to Nevada. He opened a repeating office at Elko, that state, in the spring of 1871, and in October following was transferred to Eureka, at that time but a camp. Here for eighteen years Mr. Spinner remained as the manager of the Western Union Telegraph Company, when he resigned to enter the railroad service at Palisade, Nev. His election in 1892 to political office caused him to return to Eureka, the county seat, and where, in 1895, he was reappointed to his former position of manager of the Western Union interests at that point.

Charles Exera Brown.

C. Exera Brown, of Chicago, a former telegrapher, who was actively engaged as a military

C. EXERA BROWN,
Chicago, Ill.

telegrapher during the Civil War, was born October 28, 1839, in Bloomfield township, Huron County, Ohio. In 1858, at Adrian, Mich, after a boyish experience as a candy and apple peddler, and newsboy on the railroads, he commenced the study of telegraphy, in the meantime filling numerous railroad positions. An apt student of the dots and dashes he soon acquired the ability to send and receive good Morse, and was given charge of a railroad station. In 1863 he went to Nashville, Tenn., to engage as a military telegrapher, which he did under Colonel J. C. Van Duzer, serving until the close of the war, mostly in Tennessee and Alabama, and with a devotion to duty for which he received a number of letters of commendation. After a brief return to the railroad service as agent and operator at Osgood, Ind., he embarked at Adrian and Saginaw, Mich., in the business of publishing trade circulars, city directories and railroad gazetteers, his business operations gradually extending to include sixteen states and territories. Other business employments have also engaged his attention. Mr. Brown had personal acquaintance with many well-known public people of whom he relates numerous interesting stories.

Clinton Wallace Gulick.

Clinton W. Gulick, well known as a constructor of telegraph lines, was born in Pennsylvania

C. W. GULICK,
White River Junction, Vt.

March 26, 1839. In 1861 he first entered the telegraph service, engaging in construction work in the employ of the Atlantic and Great Western Railroad. In 1864 he joined the United States Military Telegraph Corps in the Army of the Potomac, under Dennis Doren, later being transferred to the Army of the James as Chief of Construction under John H. Emerick. It fell to Mr. Gulick's lot to run the first wire into Richmond after the evacuation of that city. Sent to the Department of the South, under Colonel James R. Gilmore, he there remained until 1866, when he again entered upon railroad telegraph construction work in the Middle States. In 1870 he entered the Western Union telegraph service in New York, as general foreman of construction, once again coming under the direction of Dennis Doren. In 1874 he became superintendent of construction at Chicago of the Atlantic and Pacific Telegraph Company, and in 1878 transferred his services to the American Union Telegraph Company and was detailed for work in the Middle, South and Southwestern states. In 1881 he returned to the employ of the Western Union as superintendent of construction at Minneapolis, a position he retained until 1892, when he accepted the appointment by the Postal

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Telegraph Company as Right of Way agent, at Chicago. In 1894 he again enlisted in the service of the Western Union as general foreman, being stationed at White River Junction, Vt. After ten years in this position he retired, having completed forty-three years of active work constructing telegraph lines, distributed over thirty-five states. Mr. Gulick continues to make his home at White River Junction.

Orry Mortimer Shepard.

O. M. Shepard, of New Haven, Conn., general assistant of the New York, New Haven and Hartford Railroad Company, a former telegrapher and a member of the executive committee of the Society of the United States Military Telegraph Corps, is an Ohioan, his native place being

ORRY MORTIMER SHEPARD,
New Haven, Conn.

Cleveland, where he was born November 9, 1842. He became identified with the telegraph service at Honnoye Falls, N. Y., in 1857. In 1863 he entered the military telegraph and railroad services of the government, where he remained until the close of the war. Going west in 1865, he became train despatcher of the Gilman, Clinton and Springfield Railroad, now embraced in the system of the Illinois Central, in which service he rose through various grades, reaching that of superintendent of telegraph, master of transportation and assistant superintendent. From 1874 to 1880 he held the post of assistant general superintendent of the St. Louis and Southeastern Railroad. In 1880 Mr. Shepard accepted the superintendency of the old New York and New England Railroad, now merged with that of the New Haven, with the latter of which, in 1882, he became a division superintendent, afterwards serving as assistant to the president. From March, 1886, to March, 1890, Mr. Shepard was general superintendent of the New Haven, and on the latter date was transferred as superintendent ot the New York division, where he remained until June 1, 1903, when he was appointed general superintendent, with headquarters at New Haven.

Seeking rest, Mr. Shepard retired from this responsible position and its arduous labors, on October 1, 1907, and accepted that of general assistant, in which he now serves the New Haven system in an advisory capacity. Mr. Shepard is held in high esteem in railroad circles as a man of superior executive abilities and of high character, respected also alike for his kindly manner.

Spencer B. Rumsey.

Spencer B. Rumsey, a member of the United States Military Telegraph Corps, a former railroad and commercial telegrapher, now retired and living at Oakmont, Pa., is a native of Fitchville, Huron County, O., where he was born March 12, 1846. He commenced the study of telegraphy April 7, 1862, in the office of the Milwaukee and St. Paul Railway Company at Hartford, Wis., a year later, March 23, 1863, receiving his appointment as an operator in the same interests at Sparta. On September 1 of that year he was transferred to the superintendent's office at Milwaukee. From September 1, 1864, to October 31, 1865, young Rumsey saw active duty in the mili-

SPENCER B. RUMSEY,
Oakmont, Pa.

tary telegraph. Returning to civil life he entered the service of the Milwaukee and Minnesota Railroad Company as superintendent's clerk and telegraph operator. On January 1, 1868 he accepted the managership of the Pacific and Atlantic Telegraph Company at Philadelphia, his promotion to be superintendent of the eastern division of that company following on May 10, 1873. He was appointed special agent of the Oil Creek and Allegheny River, and Buffalo, Corry and Pittsburg railway companies, April 1, 1875, receiving the further appointment on September 1, to a like office in the service of the Allegheny Valley Railroad Company, acting jointly with the two roads first mentioned until September 1, 1878, when he continued in the capacity of special agent for the latter road alone. On January 14, 1887, he was promoted to the superintendency of the Low Grade division of the Allegheny Valley Railroad Company, filling this position until July 31, 1900, when he retired from all active business.

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OLD-TIME TELEGRAPHERS

Sketches of Whom Have Not Previously Appeared in Telegraph Age.

Edward Dickinson.

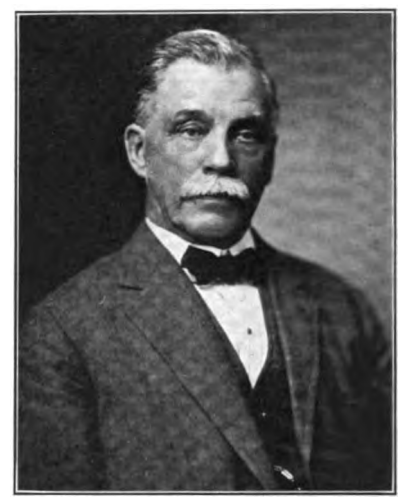
Edward Dickinson, who is now vice-president and general manager of the Kansas City, Mexico and Orient Railway Company, at Kansas City, Mo., illustrates in his career inherent possibilities, in some degree possessed by every man, and which may be enhanced by close attention to duty, observation and study, that may result in elevating one to high position in the struggle of life. Mr. Dickinson was born in Cumberland, Md., and became connected with the telegraph at Cleveland, O., in May, 1865, serving the Atlantic and Great Western Railway as a telegraph operator from that date to 1869, subsequently serving during 1870-71 as assistant train despatcher and train baggagemaster. From 1872 to 1902, inclusive, in the Union Pacific service at Omaha, Mr. Dickinson rose through the successive grades of telegraph operator, trainmaster, division superintendent, general superintendent,

EDWARD DICKINSON, KANSAS CITY, MO.
Vice-President and General Manager, Kansas City, Mexico and Orient Railway.

assistant general manager, and general manager, covering the last eleven years with that company. His proved capacity as a railroad executive led to his being called to his present position, which he has filled with increasing ability since 1903.

Alfred Weller.

Alfred Weller, who at the age of seventy-three is still actively employed in the Western Union Telegraph Company at Chicago, was born in Lewis, England, April 10, 1835. He commenced his telegraph career as a messenger at Marshall, Mich., in 1847, succeeding to the position of an operator in 1848. In the fall of that year he took the election returns which placed General Zachary Taylor in the Presidency. He read by sound and such was the suspicion directed against that method at that time, that he was threatened with dismissal. A period spent at school was followed by a return to the telegraph, this time at White Pigeon, Mich. In 1857 Mr. Weller was appointed manager of the Western



ALFRED WELLER, LA PORTE, IND.

Union office at Milwaukee, Wis., a position he held continuously for forty years, until 1898, during which long period he rendered most efficient service.

Dr. William R. Andrews.

Dr. William R. Andrews, a practicing physician of Mannington, W. Va., is a graduate from the field of telegraphy to that of medicine. The doctor hails from Michigan, where he was born October 1, 1861, in Thornapple township, Barry County. Owing to the death of his father the lad was early thrown upon his own resources, and on January 8, 1876, he became a messenger at Washington, D. C., for the Western Union Telegraph Company. Although his education in early years had been somewhat neglected, the boy endeavored by hard study at odd times to overcome this objection, and to acquire the art of telegraphy. This he was able to do and in his nineteenth year became an operator in the main office. In 1881 he transferred his services to the Mutual Union Telegraph Company, and the year following was sent to Dayton, O., as the special agent of Superintendent E. A. Leslie to straighten out a local tangle and to improve the service at that point, all of which he accomplished. Returning to Washington he became night manager of his company, until consolidation with the Western Union was effected, when he became night manager for the American Rapid Telegraph Company, also at Washington. Following the strike of 1883, in

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which he participated, although opposed thereto, he found employment in brokers' offices until the advent of the Postal at Washington, when he was

DR. W. R. ANDREWS, MANNINGTON, W. VA.

appointed night manager of the newly established office, afterward becoming chief operator. During this time, Mr. Andrews studied medicine, which he continued at Philadelphia while serving on the Postal night force at the time when Charles C. Adams, now second vice-president of the company, was superintendent. Graduating in 1892, second in a class of sixty-five, Dr. Andrews established himself first at Rockville, Md., removing after eleven years of successful practice to his present place of residence.

Franklin Pierce Ainsworth.

Franklin P. Ainsworth, president of the First Bank of Glenwood, at Glenwood, Wis., a former

F. P. AINSWORTH, GLENWOOD, WIS.

telegraph operator, was born at Littleton, N. H., May 9, 1852. He learned telegraphy while yet a boy, and before reaching his fifteenth year, namely, in March, 1867, became an operator at Bath, N. H. Going west he found employment as an operator, and eventually received the appointment as manager of the telegraph office at St. Peter, Minn. For twenty-five years he was an operator and station agent for the Omaha Railway, resigning which to enter the banking business. Mr. Ainsworth is a frequent attendant at the reunion of the Old Time Telegraphers and Historical Association. He stands high in Masonic circles, having occupied the position of Grand Junior Warden of the Grand Lodge of Wisconsin. He was also honored by having been elected Grand High Priest of the Grand Chapter of Royal Arch Masons for the year 1904-5.

William A. Robb.

W. A. Robb, chief operator of the Western Union Telegraph Company, at Portland, Ore., was born at Montreal, Canada, February 27, 1870. His entry into the telegraph service dates from June, 1884, in connection with the Great North Western Telegraph Company, in his native town, first as counter clerk, from which he was advanced to the operating department. Later

W. A. ROBB, PORTLAND, ORE.

he became an agent for the Canadian Pacific Railroad on the Pacific division, afterward becoming an operator in the commercial service of that company at Vancouver, B. C. He then accepted a position as an operator for the Western Union at Portland, Ore. Here his promotion has been steady, reaching in turn the positions of traffic chief, day and night, night chief, and now chief operator.

Mr. Robb is fond of athletic sports, and for a number of years has been a director in the Portland Rowing Club, serving also as its vice-president and president. He is secretary of the Oregon Yacht Club; secretary and treasurer of the North Pacific Association of Oarsmen, and Secretary of the Multnomah Athletic Club, all of Portland. He is president of the Western Association of Old Time Telegraphers, organized several years ago, and which has a membership of over two hundred of those who have been in the telegraph business over fifteen years.

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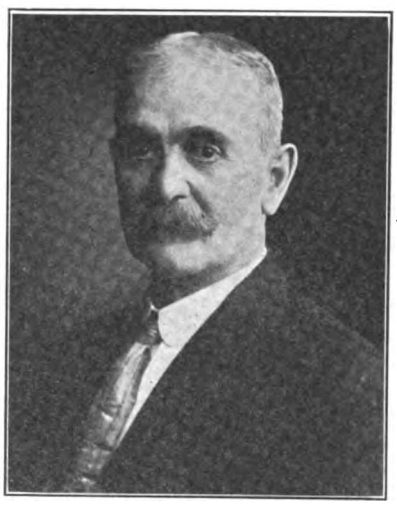
David S. Anderson.

David S. Anderson, the Western Union manager at the Board of Trade, Chicago, is a well-known member of the telegraphic fraternity, by which he is highly regarded. He was born at Mansfield, O., in August, 1847, at which place, in 1863, he became connected with the telegraph as a messenger. He was afterwards employed as an operator, in which avocation he became expert, at Fort Wayne, Ind., Crestline, Alliance, Orrville and Mansfield, Ohio, and at Oil City and Titusville, Pa. He made an effort near the close of the Civil War to enter the military telegraph service, both in the Army of the Potomac and at Nashville, Tenn., but without success, as there were no vacancies at the time. He then returned to Western Union employ, first at Cleveland, afterwards at Sandusky, and then at Chicago, reaching the latter place in July, 1867. His fine qualifications as an operator brought him recognition, for he subsequently reached the positions

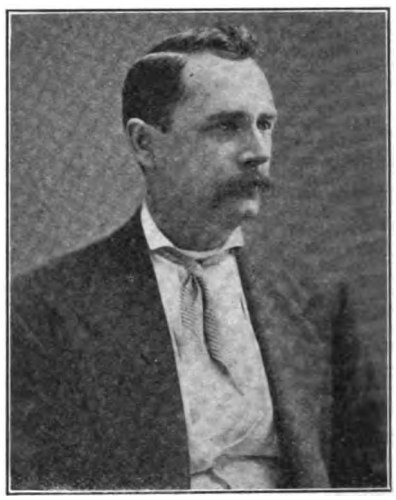


DAVID S. ANDERSON, CHICAGO, ILL.

of wire chief and assistant manager of the main office. In 1889 he received the appointment of manager of the Board of Trade office, a place of much responsibility, which he has since continued to fill with credit.

Henry Lester Gregg.

Henry L. Gregg, a well-known telegrapher, who comes of a meritorious New England ancestry, was born at Albion, N. Y., September 26, 1834. With the advent of telegraphy he became interested in the art, and when a youth learned to master the dots and dashes, and became expert as an operator. His first employment as such dates from March 1, 1857, in the office at Buffalo, N. Y. During the Civil War Mr. Gregg served in the United States Military Telegraph Corps from November 7, 1861, to January 31, 1862, under General Joseph Hooker, Army of the Potomac; and from September 1, 1864, to October 31, of that year at Petersburg, Va. In the fall of 1864 he entered the telegraph office at Rochester, N. Y., where he served as an operator continuously for thirty-two years. His acquaintance in Rochester, the initial city of the Western Union Telegraph Company, was extensive and incidents of telegraph history, at the point where many of them



HENRY L. GREGG, ROCHESTER, N. Y.
Member United States Military Telegraph Corps.

originated, store his mind. Subsequent to his long Western Union experience he served as ticket agent for the Wagner Palace Car Company.

Charles J. Heath.

Charles J. Heath, manager of the Western Union Telegraph Company at Fort Worth, Texas, hails from Iowa, having been born in that state at Clinton, December 11, 1871. When fourteen years of age he entered the Western

C. J. HEATH, FORT WORTH, TEX.

Union telegraph office in his native place, as a messenger. He soon acquired the ability to telegraph, and was promoted to be an operator, afterwards serving in this capacity in the Chicago office, with frequent assignments to act temporarily as manager at various points in

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Illinois and Iowa. In 1896 he went to Houston, Tex., during the yellow fever scare at that point to help out during the then prevailing rush. Satisfied with general conditions as he found them, he remained in the South, where his abilities found quick recognition in managerial appointments in the Western Union service, first at Monroe, La., then at Texarkana, Ark., and finally at Fort Worth, where he is now located.

T. J. Farrell.

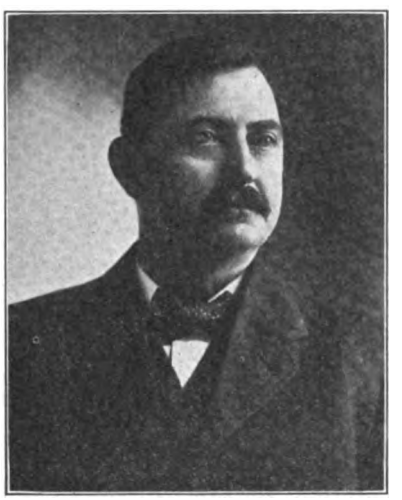
T. J. Farrell, manager of the office of the Western Union Telegraph Company at Bridgeport, Conn., is a bright member of the younger element in the telegraph service. He was born at Newark, N. J., May 20, 1884. In September, 1898, he became a telegraph messenger in his native city. Diligent and attentive to duty he received the appointment as manager of a branch office, soon

T. J. FARRELL, BRIDGEPORT, CONN.

thereafter becoming a clerk and an operator in the main office. From Newark he was transferred to a clerkship in the office of the superintendent at New York. From thence he was sent to Hartford, Conn., there to take the position of audit clerk in the superintendent's office in that city, subsequently being made estimate clerk, from which he was promoted to the cashiership of the office. His all around acquaintance with the telegraph business and proved executive qualities, secured him the appointment as manager at Bridgeport.

James M. Maddox.

James M. Maddox, superintendent of the American District Telegraph Company, at San Francisco, was born on a farm in Putnam County, Ind., October 16, 1860. He became a messenger at Crawfordsville, Ind., October 1, 1877. His first position as an operator was secured one year later when he was appointed assistant to a railroad agent at a salary of $5 a month and board and lodging. After subsequent service in railroad work Mr. Maddox entered the Western Union employ in 1881 as an operator at Indianapolis, Ind. Later at Peoria, Ill., he was with the Mutual Union, thence transferring his services to the Western Union, first at St. Louis, then at Kansas City and Omaha, where he also entered the railroad service, returning to the Western Union at Kansas City. June 1,



JAMES M. MADDOX, SAN FRANCISCO, CAL.

1884, he was appointed manager of the Pacific Mutual Telegraph Company at Atchison, Kansas, from which place he was transferred in the same capacity to Omaha. After this at Sedalia, Mo., and Little Rock, Ark., he was again in the railroad service. From the summer of 1887 to January 1890, he was a Western Union operator at St. Louis, when he was appointed manager of the time service. In November, 1892, the burglar alarm and night watch service of the Commercial Telegraph Company engaged his services. From the fall of 1894, to June, 1902, the was manager of the Missouri District Telegraph Company. In May 1903 Mr. Maddox was appointed manager of the American District Telegraph Company at San Francisco, from which he received promotion August 1, 1908 to the position of superintendent of the signal department of the company for the Pacific division.

Otto Strubel.

Otto Strubel, a well-known electrician and submarine cable engineer, of whom, unfortunately, a picture is lacking, is a German, the year of his birth in that country being 1852. He became identified with the telegraph in 1881, entering the employ of Siemans Brothers and Company, the cable manufacturers, at Woolwich, England. In this service during the nine years following, which proved a valuable school of instruction, he gained extensive practical experience in the construction and laying of several Atlantic cables, a field of endeavor in which he became expert. He also assisted in the laying of the Halifax

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and Bermuda cable, in the laying and subsequent repairing of the French cable, later, again, returning to the service of the French Cable Company. He aided the United States government in the laying of the cables in the Philippine archipeligo, and has since been engaged with the Central and South American Telegraph Company.

Walter Wentworth Massie.

Walter W. Massie was born in Providence, R. I., December 15, 1874. He was educated in the public schools of that city and studied mechanical and civil engineering at Tuft's College and Brown University. In 1896 he entered the city engineer's office of Providence, where he won rapid promotion. Ever since childhood Mr. Massie has been interested in electricity and made it a hobby. Having read about discoveries in wireless telegraphy, in the winter of 1896-7 he commenced systematic investigations in the art which resulted in his invention of the Massie wireless telegraph system of to-day. In April, 1905, he organized the Massie Wireless Telegraph Company, holding the position of general manager. Through his personal efforts, the Massie company, in 1906, obtained control of The Marine Transmission Company, the latter operating numerous steamers and land stations equipped with the Massie system, and the Bureau of Marine Intelligence was organized. During the same year Mr. Massie was elected president of each of these three companies, which positions he has held ever since; his positions with the two former companies being president and general manager. It is noteworthy that Mr. Massie's name has never been associated with any of the sensational stock-jobbing wireless deals. He has kept the records of his companies clean, and has set an example of how a wireless business may be conducted on a paying basis by adhering to strictly legitimate business methods. Mr. Massie is the joint author with Charles R. Underhill of the new volume entitled "Wireless Telegraphy and Telephony."

WALTER W. MASSIE, PROVIDENCE, R. I.
Inventor Massie Wireless Telegraph System.

Charles Reginald Underhill.

Charles R. Underhill was born in Chappaqua, N. Y., November 2, 1874. He attended the public schools, practicing telegraphy in a telegraph office evenings. In 1891 he entered the employ of the Western Electric Company, New York, in the inspection department. This position gave him an excellent opportunity for the study of telegraph and telephone apparatus, and while gaining a practical knowledge of applied electricity he also acquired a technical education by diligent evening study, which secured his promotion to the charge of the electrical testing and inspection in this department. In 1900 Mr. Underhill accepted the position of chief electrical engineer of the Varley Duplex Magnet Company. Realizing the lack of published data regarding electromagnets and solenoids to perform a given duty, he devoted several years to the careful study of this branch of design. Since 1904 Mr. Underhill has been engaged in consulting electrical engineering in New York. He is the author of a book entitled "The Electromagnet," and has contributed numerous articles to the technical press, describing the results of his experimental research. He is also the inventor of an instrument for printing in English characters wireless messages sent in either the Morse or Continental codes, which has given excellent results over distances usually coverede by the ordinary ink recorder. Mr. Underhill is the joint author with Walter W. Massie of the new volume entitled "Wireless Telegraphy and Telephony."

CHARLES R. UNDERHILL, NEW YORK.
Inventor and Electrical Expert.

Eternal vigilance is not only the price of liberty, but of every other good thing.

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Jesse Wright Crouse.

Jesse W. Crouse, now retired, and a resident of Philadelphia, Pa., was born at Cassville, Pa., August 8, 1838, and entered the telegraph service in June, 1855, at Lewiston Junction, Pa., afterwards becoming a telegraph operator of the Pennsylvania Railroad, at Philadelphia. Mr. Crouse built the first line of telegraph in the extreme northwestern part of the then territory of Minnesota, running down

JESSE W. CROUSE, PHILADELPHIA, PA.

the Red River of the North from Fargo to Pembina. He was ordered to Washington in the latter part of April, 1861, by Colonel Thomas A. Scott, afterwards Assistant Secretary of War, as an emergency operator, serving from that date until the following September, and taking with him William Tinney and H. C. Snyder. From service at the War Department he was placed in charge of the telegraph office of the old Baltimore and Ohio Railroad depot, afterward being sent to Fortress Monroe, by David Strouse, there to construct a cable through the fortress to connect with a line of wire to Newport News. Mr. Crouse was assistant superintendent of the Mississippi Valley Telegraph Company, at Dubuque and Chicago, and afterwards assistant superintendent of the Northwestern Telegraph Company at St. Paul, Minn. Returning East he entered the railroad service as special agent of the auditor's department of passenger receipts of the Pennsylvania Railroad at Philadelphia, later becoming chief clerk to the auditor, a position he continued to hold until retired because of the age limit of seventy years, on August 31, 1908.

The chief Australian commonwealth electrical engineer (John Hesketh) estimates that to meet public requirements in connection with telephone and telegraphic works in that country during the next three years, £2,100,000 will be required.

"Pocket Edition of Diagrams," etc., by Willis H. Jones, electrical editor of Telegraph Age, embodies more practical information concerning the telegraph than any book or series of books hitherto published. See advertisement.

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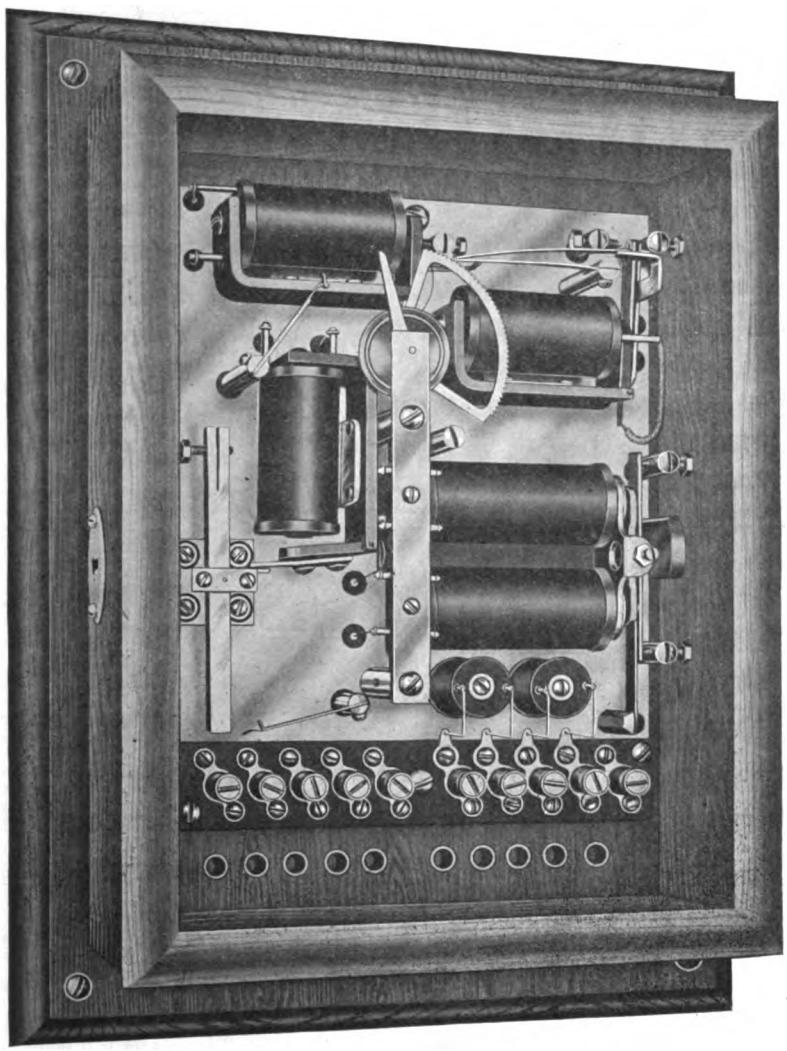

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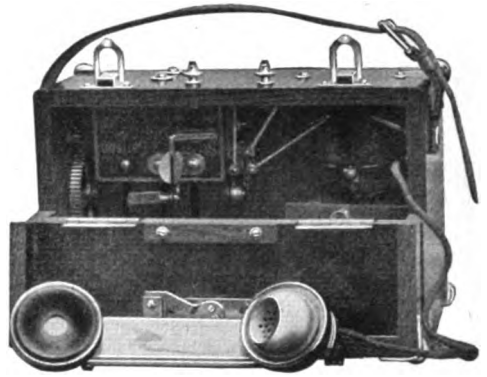

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30 to 35	1.25	63 cents
35 to 40	1.50	75 cents
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The Railroad.

The Erie Railroad will establish telephone train despatching circuits over two of its main line divisions at once, as follows: Delaware division, Port Jervis, N. Y., to Susquehanna, Pa., one hundred and four miles, and the Meadville division, Meadville, Pa., to Corry, Pa., forty-one miles. This work will be executed under the supervision of E. P. Griffith, superintendent of telegraph.

Train Despatching by Telephone.

The subject of train despatching by telephone is receiving so much thoughtful consideration at the present time, that the matter in its every phase of development and application has become vested with special interest. In the desire to acquaint themselves relative to means and methods the railroad telegraph superintendents are seeking every available avenue of information. One question frequently asked is that relative to which particular portion of the pole is the best to locate the telephone despatching circuits. A well-known authority, in answering this query, also discussed the general proposition at length in the following informing manner:

"The best location for telephone despatching circuits on poles is on the top arm and the pole pins. In this position they are free from interference caused by broken wires falling across the circuit or by pieces of wire which may be thrown across the wires on the pole. The importance of keeping these circuits free from interference is obvious, and the construction used should be of the highest grade. In addition to this, the lines should be maintained in first-class condition if a superior degree of telephone service is expected, and I think you will agree with me that the best service is necessary for so important a use. It is my belief that every influence should be used to induce the railroad companies to adopt a high standard of transmission. By this is not only meant the volume of transmission, but the quality of transmission. As you are probably aware, it is possible to have a large volume of sound on a circuit, but have a quality so poor that words and letters are misunderstood. These two characteristics of telephone transmission, namely, volume and quality, are affected by the apparatus used as well as the kind, size and resistance of the wire in the circuit. It must also be remembered that service will be affected by the inductive disturbances caused by adjacent circuits, and steps should be taken to reduce this interference to a minimum. It is not safe to assume that transpositions every half mile will remove inductive disturbances from a circuit, as, in many cases, it will be found that the conditions along the line vary, some cases being much more severe than others, and for this reason sections of a line will require more transpositions per mile than others. When constructing new telephone lines it is much easier and cheaper to provide for transpositions than after the line has been constructed, and for this reason it is advisable to make a study of the inductive disturbances before construction work is started, thus enabling the construction crew to make the necessary transpositions along the line at the start and with the minimum expense.

"Another thing to be remembered is that even with a properly constructed line equipped with the best type of telephone apparatus, the service can be seriously affected by employes not using the telephone in the proper manner. I had occasion recently to observe the service on a number of despatching circuits, and have found, in many cases, that the operators, although instructed to do so, do not speak into the transmitter, or, if they do speak into it, have their lips several inches away from the mouthpiece. The effect of this is not apparent to the operator, but is very noticeable to the despatcher, as it greatly reduces the volume and quality of transmission over the circuit. Instructions should be issued covering the use of the apparatus, and employes should be supervised to see that these instructions are followed if the best service is expected.

"In connection with the maintenance of the service, it should be remembered that at busy stations the battery maintenance will be higher than at stations where the telephone is used less frequently. Regular inspections should be made to determine the condition of the batteries at the various stations. Inspectors should be provided with suitable measuring instruments to insure accurate information being obtained by these inspections."

There is always a constant demand for books treating on the general subject of electricity from a point of view and in a manner making clear information that the average individual desires to know, but which he frequently finds so difficult to obtain. A volume of this character which is not amateurish in expression, but which, while not designed for experts, is nevertheless valuable to the seeker after knowledge, is prized by those whose opportunities for gaining information on the several branches have been limited. Such a book is "Electricity Made Simple," by Clark Caryl Haskins, the well-known electrical writer. The dedication illustrates the democratic purpose of the author, for it reads, "To my many friends in blouse and overalls, with kindest remembrances." The volume is bound in paper covers, embraces nearly 240 pages, and in its twenty-one chapters, and 108 illustrations, touches upon and illuminates a variety of topics such as are seldom so comprehensively assembled in a single volume. When it is considered that the cost of the book is but fifty cents it will be seen that this low price puts it within the reach of everyone. It will be sent postage paid on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

The new classified catalogue of books on the telegraph, telephone, wireless telegraphy, electricity, etc., published in TELEGRAPH AGE, may be had for the asking.

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A Tantalum Wave Detector, and Its Application in Wireless Telegraphy and Telephony.

It has been known for some years that the metal mercury lends itself well to the purpose of constructing a detector of electric oscillations which is capable of spontaneously returning to its initial or sensitive condition, or, in other words, is spontaneously decohering. The two elements which have hitherto been known to show this property when used in conjunction with mercury are iron (steel) and carbon. Both of these have been employed, singly and together, in the Italian navy coherer, otherwise known as the Castelli, also the Solari coherer. The use of carbon is, however, very undesirable for reasons which are well known, while iron is a very unsuitable metal for use in places where there is any considerable amount of moisture in the air; at the best it is only a question as to how long rusting can be deferred.

These considerations had, as early as 1902, led the author to consider means for utilizing a noble metal in combination with mercury. It was at that time found impossible to make use of platinum without the employment of some liquid dielectric—in this case pure water—interposed between the mercury and the platinum, and then only when the platinum wire was glass-sheathed. Such an arrangement required, in addition, to be mechanically restored to the sensitive state. The recent trend of work in wireless telegraphy has all been in the direction of the employment — at least for general use — of telephonic or aural reception, and hence coherers have mostly fallen into disuse, especially as the only reliable and durable ones were those which required mechanical restoration. The advent of the tantalum lamp, which appeared to promise that this hitherto unobtainable metal would soon be commercially available, seemed to hold out some possibility of successfully overcoming the previous difficulties in the way of finding a suitable noble metal. For the fact that tantalum is a noble metal in so far as its chemical behavior is concerned; that it is indifferent to atmospheric influences; that it has great strength and ductility; and, finally, that it is absolutely indifferent to mercury, seemed to bear out this view.—L. H. Walter, M. A., in The London Electrician.

Kiebitz's Directive Arrangement for Electric Waves.

The Electrical Review, of New York, gives a brief description of a directive system for electric waves which has recently been patented in Germany by Dr. F. Kiebitz. In the arrangements hitherto proposed for this purpose use has sometimes been made of some form of compound oscillator—that is, one in which an electric or open oscillator is combined with a closed oscillator. Dr. Kiebitz's device consists of a new arrangement of the compound oscillator. Although it has been tried over short distances only, sufficient data are given for an energy diagram to be plotted. In it the directed electromagnetic waves are excited by giving the radiating system such a shape that although the electric and magnetic systems generated in space have each an axis of symmetry, the two axes are in this case perpendicular or make an acute angle, while at the same time the direction of the magnetic force is inclined to that of the electric force. In this case the plane of the greatest magnetic force is inclined to the plane of the greatest electric force, the line bisecting the enclosed angle being in the direction of the greatest energy emission. The same device can be used at the receiving station, when it then absorbs chiefly those waves having the direction in which it is set. The arrangement consists of a solenoid with its ends connected to two metal surfaces. When such a system is excited inductively the electromagnetic field which it sets up consists of a magnetic doublet oscillating in the direction of the axis of the solenoid and an electric doublet oscillating in the direction connecting the two metal surfaces. The electromagnetic field thus has a minimum in the plane containing these two directions and a maximum at right angles to it. Nothing is changed when the earth is substituted for one of the metal surfaces, the direction of the maximum force then being along the earth. Experiments with this apparatus have been conducted both in the laboratory and in the open. The wave-length employed was twenty-two meters and the received energy was measured thermally. On revolving the transmitter in the laboratory a diagram of received energy was obtained having the form of a narrow lemniscate. In the open the ratio of maximum to minimum energy received was 70 to 1. A directive receiver gave the same results. With an electrolytic receiver at thirty meters, receiving distinct signals at zero degrees, rotation of the arrangement through thirty degrees caused the signals to cease. Before the practical value of the apparatus can be determined, experiments on a larger scale must be conducted.

Attempts were made at the Tegel manoevring grounds, near Berlin, on July 23, to telegraph from the wireless stations at Nauen and Norddeich, and from a portable station at Tegel, to two free balloons, which ascended from the latter place and which were equipped with receiving apparatus. It is stated that the results of the experiments were satisfactory. They were continued on the following day with the old military airship. A complete wireless station had been fitted in the car of the airship, which ascended and manoeuvred at a height of 800 feet, where it had to face a strong wind from over the Tegel proving ground. Several messages were sent to and received by the officer in command of the airship. The experiments are to be extended and endeavors made to exchange messages between the airship and the stations at Nauen and Norddeich.

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Studying American Telegraph Systems for Chinese Adoption.

Henry K. Hudson, an Englishman, who is connected with the government telegraph lines in China, is in San Francisco studying the telegraph service of the Southern Pacific, Western Union and Postal companies. He is to make similar studies in the East and will then make an official report on the subject to the Chinese government.

"The Chinese," remarked Mr. Hudson in an interview, "are extending their telegraph system to every corner of the empire, and Pekin will soon be in communication with all of the principal cities of Mongolia, Turkestan and Tibet, as well as those of China proper.

"The wires are being erected and operated by Chinese. The telegraph system of the empire is under the direction of Mr. Long, a Yale graduate, who came over here with a commission of inquiry two or three years ago, and I believe he is chairman of the Yale Alumni Association of China.

"He occupies a large building in Shanghai, with a force of forty or fifty clerks and operators, and has been directing the extension of the lines from there.

"It looks a little odd to see a Chinaman at a telegraph key, and people wonder how they are able to communicate by wire in their own language. But the process is very simple. They use a phonetic system based upon the Morse code and wire the syllables as they sound to the ear, without using an alphabet in the Chinese language.

"There has been a telegraph line from Darjeeling, India, to Lhassa, the capital of Tibet, ever since Colonel Younghusband, of the British army, led his expedition to that city in 1904, and English residents are now representing the Indian government of India there, who need it to communicate with the viceroy at Calcutta. But the line is not open to the public and the Chinese government needs a means of communication with Tibet very much, because it is engaged in the organization of that province. The nearest telegraph station to Lhassa on the Chinese side is at the city of La-Chien-lu, on the border between Szechuan and Tibet, and the wires will be extended from there."

Seeing at a Distance.

Mr. Jules Armengaud, a well-known engineer of Paris, has recently experimented with image transmission at a distance, and hopes, by means of his apparatus, to solve this very difficult problem. This refers naturally to what we call "seeing at a distance," and not to the sending of photographic views over a wire, as, in fact, the latter is now accomplished in a very satisfactory manner by Dr. Korn's apparatus. What Mr. Armengaud wishes to carry out is a method of direct vision by the use of a selenium cell and a rapidly moving apparatus which will cover all the parts of an image in a very short space of time and thus give a practically permanent impression of the whole image on the retina.

There are at present two generally recognized methods by which we may hope to solve the problem of "seeing at a distance." One of these is to decompose a photograph into a number of points, as we have in a half-tone plate, and to transmit each of the points in succession by means of a selenium-cell device. At the receiving station a permanent record would be made of each of the points in a suitable apparatus, so as to reproduce the image in the form of the original.

However, as the number of points is very great, even for a small image, such a method would require a considerable time to cover all the parts of the photograph, or a direct image projected by a camera, and for this reason inventors seek rather to solve the problem by the second method, which consists of covering all the points of the image by a rapidly moving device and to project the light from each on to a selenium-cell apparatus.

The receiving device would move synchronously with the former and would throw a moving spot of light upon a screen so as to reproduce all the parts of the image before the eye would have lost the impression. This would require the whole reproduction to be made within 0.1 second. In this case the disadvantage lies in the great speed which is needed, for a great number of impulses must be sent over the line within this time. The inertia of the selenium cell is another factor, and a leading one, which must be contended with in this solution. Nevertheless, the attention of inventors seems to be turned rather to this method, inasmuch as the other method is counted as almost impossible to carry out in practice. — O. de Courcy in the Western Electrician.

Mr. A. G. Saylor, assistant general superintendent, Western Union Telegraph Company, New York, in renewing his subscription, said: "Telegraph Age is undoubtedly exclusive in its value to those engaged in the telegraph service; not only on account of its complete news, but especially on account of the very instructive articles published in each issue relating to the various branches of the service."

The Washington-Alaska military and telegraph system has been extended to Cordova, Alaska, by the construction of a branch from the existing cable on the north side of Montague Island to Cordova. The work was completed by the cable ship Burnside and the office at Cordova was connected and opened for business on August 12.

The articles under the standing head of "Some Points on Electricity," published regularly in TELEGRAPH AGE, are filled with practical information for the up-to-date operator. Send for a sample copy.

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LETTERS FROM OUR AGENTS.

The current information of any office will, if carefully chronicled, furnish a welcome digest of news that will be read with pleasure and satisfaction by thousands, and this limit should constitute the legitimate contents of all letters. And we wish that our correspondents would avoid the too frequent habit, at all times a bad one, of abbreviating words in writing. This is a peculiarity among telegraphers, we know, but what may be plain to the writer, and for local interpretation, is usually a mystery to the editor, and is apt to lead to an error in the printed statement.

DENVER, WESTERN UNION.

Business has been quite dull for the past six months with the exception of a few weeks this summer during the convention rush, which taxed the capacity of the office. During the convention proper one million seven hundred thousand words newspaper special was transmitted, besides the flood of individual telegrams. The manner in which the whole thing was handled was a credit to the local officials and the staff, as well as to Assistant General Superintendent McKisick, of Chicago, who was in Denver several weeks prior to the convention getting things lined up.

The nomination of Bryan took place about three o'clock on Friday morning. About a quarter of twelve that night several of the delegations, including Tammany, of New York, requested that the big Western Union electric clock in the main hall be stopped before twelve o'clock in order that Bryan should not be nominated on Friday (the bad luck day), as he had been twice previous. It was found no one had a key to unlock the clock, and a message was sent to the main office of the Western Union, and a key was hurried to the hall by a messenger boy on a wheel. The clock was stopped exactly three minutes to twelve, and so according to the clock Bryan was nominated on Thursday. Mr. R. P. Cowardin has the clock key for a souvenir, and says if Mr. Bryan goes to the White House he will present him with the same.

Manager J. F. Reade has just returned from a two weeks' vacation, spent on his ranch near Alamosa, Col. Assistant Manager George E. Lawton acted as manager during his absence.

SALT LAKE, POSTAL,

What Ogden was fifteen years ago Salt Lake City is to-day—the telegraphic gateway to that vast territory embracing the states of Utah, Nevada, Idaho, Montana, Washington and Oregon. The office is one of the best equipped and best appearing telegraph offices in the west. Mr. Donald McNicol is the manager.

The chief operator, R. D. Riley, has had long experience in the operating room, having worked at 195 Broadway, New York, for twenty years as a wire chief. Mr. Riley has just returned from a vacation spent in the mountains. The night chief operator, C. F. Bunnell, is an experienced commercial telegraph man, having previously worked as a chief operator at Omaha, Neb. George Denison is assistant chief and repeater rider, having charge of the fifth overland circuit worked duplex from Chicago to Seattle. Mr. Denison is an old timer in the west, having been one of the original Ogden experts, when twenty-five years ago they handled fifty messages an hour with a pen.

The Chicago bonus circuit is worked by L. O. Loudenber.

Other promising members of the operating force are D. H. Townsend and D. J. Homer.

Maintenance and repair of lines is in the hands of Delos Marsh, foreman. The clerical force consists of Miss B. Malin, cashier; Miss McPherson, bookkeeper, and Messrs. M. Bowers, A. W. Copfer and J. A. Phegley, clerks. The office maintains a district service which keeps eight messengers busy.

NEW YORK, WESTERN UNION.

Business on the various circuits reaching summer resorts remains comparatively heavy, for gayety on land and water at Newport, at Mt. Desert, at Long Branch, and other noted places, continues unabated, and attracts its hordes of participants.

Few changes are occuring now-a-days in this office, although the largest telegraph headquarters in the country, affairs moving with much regularity and evenness. This may possibly appear odd to outsiders, not acquainted with the situation as it exists here at present, but the ranks are full, apparently so with permanent holders, and the items hitherto so frequently current relative to resignations and appointments, find no place just now to disturb the tranquility of the operating department.

The Barclay department occupies a very busy section of the operating room on the seventh floor. An enormous amount of business is handled daily by this new printing telegraph system. The development in this method of transmitting telegrams during the past twelve months is nothing short of marvelous.

Miss M. L. Case, manager of the office at 296 Broadway, who has been ill and away in consequence on a leave of absence, has fully recovered her health, and is now able to take charge of her office again.

Miss Gertrude Marsh, daughter of William Marsh, for some time past employed in the commercial news department of this company, died at the residence of her brother-in-law, Peter McMillen, at Saratoga, N. Y., August 21. The remains were brought to New York and buried from the family residence at 879 Herkimer street, Brooklyn, on Sunday, August 23.

Miss Nellie Turner, formerly of this office, was married on August 18, to Mr. Matthew Tuohey, a cotton broker of this city.

Chief C. S. Pike, accompanied by his family, is spending two weeks at Lake Hopatcong, N. J.

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Assistant Southern Wire Chief Maxwell Green is passing his vacation amid the Vermont mountains.

Miss Nora Conklin, who has charge of the neo-style, is spending a few weeks in the Catskills.

J. A. Kelly, formerly of this department, and lately located at Newport, R. I., died at that place September 9, of spinal meningitis.

E. T. Burrill, general traffic chief, was pleasantly surprised by a number of his friends on September 8, who reminded him that another milestone in the journey of life had been passed. On the same evening he was again honored with the notification of his election as a delegate to the senatorial convention of the Democratic party in Brooklyn.

OTHER NEW YORK ITEMS.

The annual meeting of the Telegraphers' Mutual Benefit Association will be held at 195 Broadway, New York, on November 18, at four P. M.

Telegraphers' Aid Society Statement.

The Telegraphers' Aid Society of New York makes the following statement for the quarter ended September 6, 1908:

Balance on hand June 6, 1908.....		$20,924.65
Receipts		1,336.50
Total		$22,261.15
Disbursements.		
Sick benefits	$749.67	
Death benefits	100.00	
Expenses	151.18	
		$1,000.85
Balance on hand Sept. 6, 1908....		21,260.30
Total		$22,261.15
Summary.		
Receipts		$1,336.50
Disbursements		1,000.85
Gain for quarter		$335.65
Relief Fund.		
Balance on hand June 6, 1908.....		$3,921.88
Receipts		.....
Disbursements		8.00
Balance on hand Sept. 6, 1908.....		3,913.88
Total		$3,921.88

Balances.			
Aid Society..	$21,260.30	On deposit..	$25,000.68
Relief fund..	3,913.88	Cash on hand	173.50
Total	$25,174.18	Total	$25,174.18

J. H. Driscoll, W. T. Rogers, F. J. Nurnberg, auditors.

The Associated Press.

Addison C. Thomas, superintendent of the central division of The Associated Press, who was in New York recently, has returned to his headquarters in Chicago.

The operators of the New York Bureau had as their guests recently the operators of the Albany and Schenectady offices. The meeting resulted in a baseball game being played, which ended in a victory for the New York men by the score of 13 to 10, after an uphill fight until the sixth inning was reached. Mr. Blake, of the New York office, was umpire. After the game, which took place in Homewood Park, Brooklyn, the visitors were taken to Coney Island, where they were shown the sights and ended up the day's fun by taking a plunge in the surf.

Mr. MacNider Asks Respecting Former Friends.

In a chatty letter received from Stanley MacNider, the well-known old-time telegrapher, who now lives down in Guatemala, Central America, he comments in a reminiscent vein on many of the personages whose faces and biographical sketches appear in Telegraphers of To-day, induced to such reflections by a study of the pages of that volume. He asks respecting a number whom he used to know, among them Benjamin F. Ely, Charles F. Wood, Henry H. Ward and Thomas P. Scully. We were obliged to answer him that the two first named had passed on to join the great majority; that Mr. Ward was engaged successfully in the banking business at East Orange, N. J., and that Mr. Scully, still young, though crowned in white, was living a quiet retired life in Brooklyn, finding his chief source of recreation in frequenting Prospect Park in the summer time and attending the Brooklyn Institute course of lectures, concerts, etc., during the winter. Mr. MacNider recalls the fact that Mr. Wood was superintendent of the Union line, having wires between New York and Boston, at a time, when he (MacNider) was an operator in the office then located at 23 Wall street. Mr. Ward, he says, was the operator mostly in attendance on the through wire at the Boston terminal, while the New York end was usually worked alternately by "Bill" Porter, "Sid" Fairchilds, Henry Hotham and MacNider himself. He remarks that the wire "was good for nine hours' continuous work daily."

Mr. MacNider's recollection of Mr. Ely is that the latter was located at 145 Broadway at the time of the Civil War during a short period when the former received the war news in that office from Washington, evenings. Of Mr. Scully he says: "I have the impression that he was on the Isthmus of Panama during my time." As Mr. Scully has been considerable of a traveler in his time, holding a number of different positions in the Americas to the southward, Mr. MacNider is quite right in his "impression." It is suggested that the right thing for Mr. MacNider to do would be to return to New York and employ a vacation in revisiting old scenes and looking up former friends, and adjusting himself generally to conditions and persons as they exist to-day. Where,

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it may be asked, would Mr. MacNider himself fit in? The question is: Would he be more content to let memory with its softening influences satisfy his mind respecting the long ago rather than take the chance of suffering a possible rude shock such as a revisitation to this big city might produce after an absence of some forty years in South America and elsewhere. None the less, Mr. MacNider's friends here would be glad to see him.

It is interesting to note that Mr. MacNider began his telegraph career in Montreal in 1852 as a messenger in the service of the Montreal Telegraph Company, at the time when the now venerable Orrin S. Wood was at the head of that organization, and Harvey P. Dwight, now president of the Great North Western Telegraph Company, being an operator.

What a "Good" Trust Does for Manhood.

There are good trusts and bad trusts. Everybody says so, and everybody believes so. But, according to a recent statement, all the trusts are doing some good. Mr. John J. Carty, the chief engineer of the American Telephone and Telegraph Company, says that "it is a foot race between corporations to see which will get to the college first, and the concern that is a slow starter doesn't get any men at all." He finds that it is no longer a question whether a college graduate can get a job or not, and that it is absolutely impossible for some corporations to get the requisite number of men to learn their business, beginning at a salary of fifteen dollars a week. Mr. Carty adds: "It is the trusts that have brought this condition about, and put a premium on education. By a simple reactive process they have created schools, particularly technical education, within every boy's reach. The progress of industry and wealth has been so great that it has lifted the whole mass." The college graduates that are finding places with the great trusts, Mr. Carty says, are not aristocrats, but the sons of carpenters, machinists, small tradesmen, and thrifty workmen. They are not dudes or snobs, but they know what real work means, are amenable to discipline, obedient and responsible. In the old days, when our industries were private affairs in the hands of single owners, the latter would find places in the works for their relatives; but now, according to Mr. Carty, "there is no room for ornaments nor for relatives, unless they work their passage and a little better," for the great corporations are conducted by capitalists who seek to produce and who have no sentiment in their business. This is a view of the trust question that may not have occurred to the general public, and it is worthy of consideration.—Leslie's Weekly.

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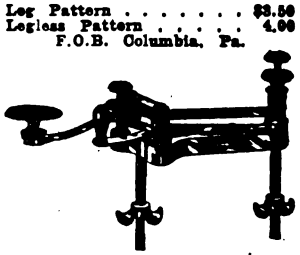

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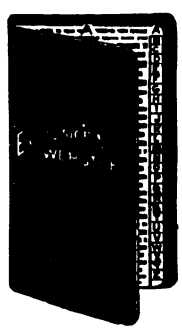

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Pneumatic Tube Improved System .....Aug. 1, 1906
Reminiscences, Old Time, Dr. L. M. Rheem, Apl. 16, May 1-16, 1906
Rudd Revolving Addressed Envelope Holder.....Feb. 16, 1906
Seaman Pole Splicing Device.....Sept. 1, 1906
Standard Time .....June 16, 1906
Storage Batteries, Willis H. Jones, Mch. 16, Apl. 1-16, May 1-16, 1906
Telegraph Tournament, International, at Boston, May 1-16, June 16, July 16, 1906
Telegraph vs. Telephone .....July 16, 1906
Telephone, Invention of .....Apl. 1-16, 1906
Testing by Voltmeters and Ammeters, F. W. Jones.....Nov. 1, 1906
Train Order Rules, Chas. Selden .....Aug. 1, 1906
Wire, Hard Drawn Copper, History of, Thos. B. Doolittle, ...Jan. 1-16, 1906
Wheatstone Bridge, F. W. Jones .....Nov. 16, 1906
Wright Keyboard Transmitter and Printer, R. Hitchcock..Apl. 1, 1906

Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Detroit, Mich., June 23, 24, 25, 1909.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Atlantic City, 1909, at a date to be named later.

Old Time Telegraphers' and Historical Association, will meet at Niagara Falls, N. Y., September 16, 17, 18.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers Association meets in 1909 at Columbus, O., at a date to be determined upon.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

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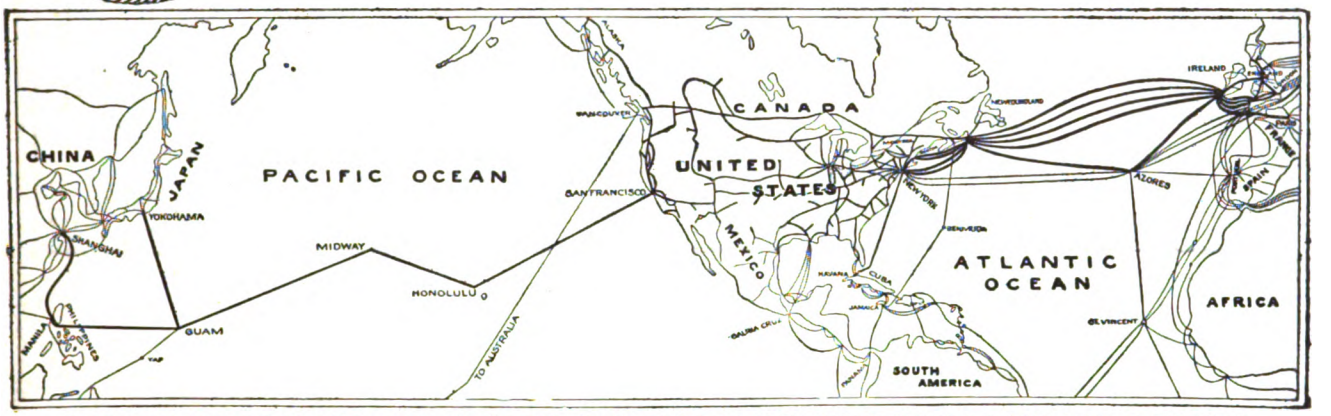

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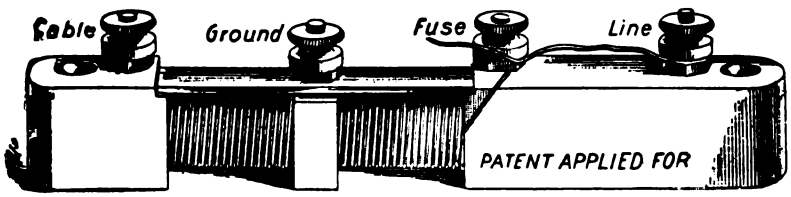

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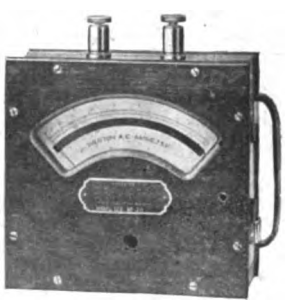

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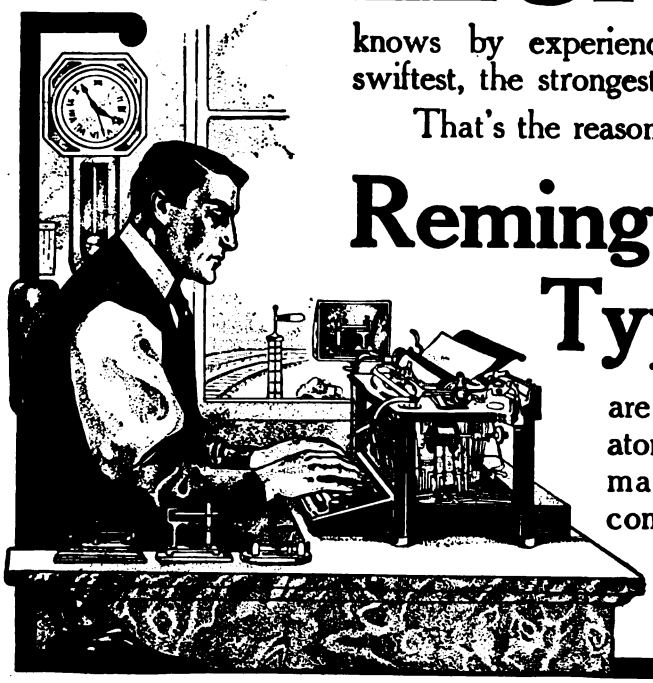

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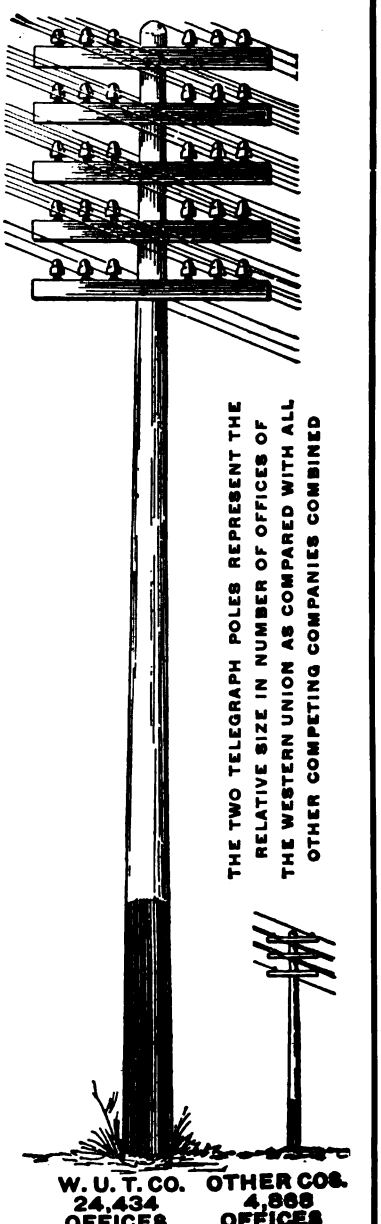

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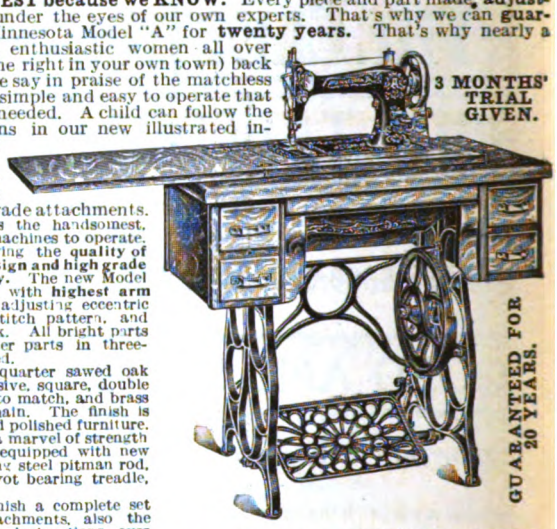

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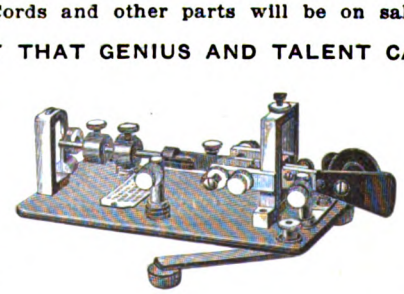

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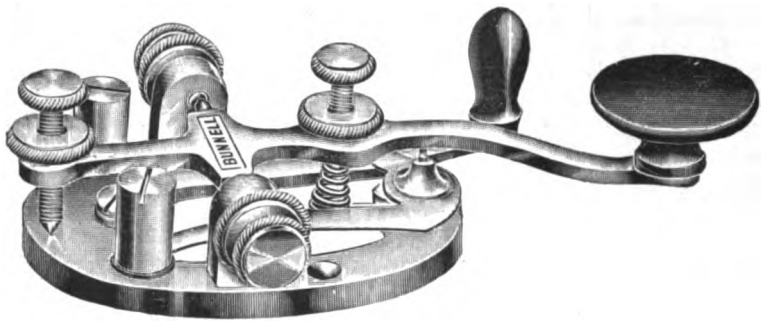

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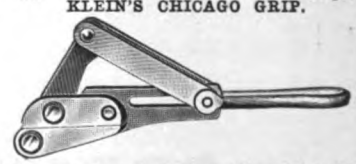

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TELEGRAPH AGE

No. 19. NEW YORK, OCTOBER 1, 1908. Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Questions from a Correspondent.

Among the many interesting questions asked by different correspondents the following letter contains one that is somewhat out of the general line of inquiry:

"On several occasions I have noticed that after obtaining a good balance on a duplex circuit that if it was not used for a period of ten or fifteen minutes the balance would apparently be somewhat off the moment the operators attempted to work it. At first I naturally concluded that the change was due to alterations in the conditions of the weather and made the necessary compensation therefor only to discover that a third balance was then required, and in nearly every case the last balance was approximately the same as the first so far as the rheostat indications went. I will state further that this occurred on days when the weather was merely damp and cloudy and not at all changeable. Because of the constancy of the weather conditions I tried the experiment of requesting the operators to start up "double" and see if by that means the balance would not right itself within a short period. In nearly every instance I found that on this particular wire it would.

"Now, everyone to whom I have related this experience says in effect that I'm dreaming, or that it was merely a coincidence. I therefore take the liberty of asking through Telegraph Age if I am alone in that experience, and if not, to request an explanation of the manner in which the operation of the circuit after a period of rest apparently rights the balance.

"One of my friends thought that possibly the relay was made temporarily "lop-sided" magnetically through a change in the resistance of one coil of the relay due to a higher temperature than its companion, as might be the case when the polarities in the line opposed continually for some length of time and current flowed through the artificial line coil only. Is there anything in this?"

We can assure the correspondent that he was not dreaming. Under certain conditions a duplex will show indications of being more or less out of balance after a period of idleness owing to the different conductivity affect positive and negative currents of electricity respectively create in a leaky conductor.

It is a well known fact that one of these currents through the electrolytic action which takes place tends to heal bad joints by coating the latter with a film of conducting medium and in this way reduces the resistance of the circuit at all such points. On the other hand the opposite polarity of current produces just the opposite effect, namely, it tends to eat away such film that may exist at bad joints and thus increases the line resistance. It is therefore obvious that on leaky circuits of the kind mentioned serious alterations in the line conductor may take place regardless of weather conditions. No doubt this phenomenon explains the necessity for so many balances being taken on some circuits when the condition of the weather is apparently favorable.

In the case stated by our correspondent it is apparent that after his first balance the keys were left in such a position during the period of idleness stated that a constant sustained current of an opposite polarity than originally flowed through the leaky line long enough to affect the resistance, and consequently throw the balance off slightly. Then after the circuit was worked duplex for an equal or longer period, the effect of the opposite polarity of current undid some of the work its companion alone had accomplished and in this way restored, partially at least, the original conditions.

If the reader will go to the switch board and after connecting an ammeter in the circuit of any leaky wire of this kind, and after noting the value of current obtained by, say, a positive battery,

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substitute a negative battery of like electromotive force, he will find that although the current value will be approximately the same at first, the needle will gradually move further up or down the scale, according to the polarity influencing it, until after a reasonable period the final value of the current will be either much more or much less than the first measure indicated.

Referring to the possibility of a relay becoming lop-sided through alterations in the resistance of the respective coils due to unequal temperature, and thus accounting for the alteration in the balance, we will state that there is nothing in the suggestion. In the first place no difference in temperature that a relay would withstand could alter the resistance of either coil in a harmful manner. Even were an alteration of a few ohms possible the difference would not change the total resistance of the circuit sufficiently to alter the line current one per cent. and we would still have the same number of convolutions of wire in the spool. A lop-sided relay is usually one having a few of its "turns" crossed out. It is the "equal number of turns" in the two spools, respectively, that counts, more than that of the actual resistance. As a matter of fact there are few differentially wound relays that possess exactly the same number of ohms in each coil The specifications demand that they be magnetically identical and owing to the non uniformity of the coil wire and manner of winding a given number of convolutions may possess a few more ohms resistance in one coil than the same number in its companion spool.

Finally there could be no such thing as the line spool being free of current while current from the home battery heated the artificial line spool only as intimated by the correspondent. Each spool contains half of each coil, namely, the main and the artificial line, and the two being wound in parallel of course lie side by side in each spool, so that any current that would heat one coil would obviously keep the temperature of its side partner up to a high degree through radiation alone notwithstanding no current was passing through such coil.

Recent Telegraph Patents.

A patent, No. 895,374, for a means for perforating slips for telegraphic signaling and other purposes, has been taken out by Maximillian Kotyra, of Paris, France. Three punches are operated by three electromagnets controlled by keys. Each key when depressed brings into operation the appropriate combination of electro-magnetic devices to operate the combination of punches corresponding.

A patent, No. 897,669, for an insulator, has been granted to Frank J. Siegwart, of Pittsburg, Pa. A bighting groove is formed on the outside and across the face of the insulator.

The following patent has expired:

Patent No. 458,585, for telegraphy, held by D. Kunhardt, Aachen, Germany.

Patent No. 459,013, for a telegraphic transmitting apparatus, held by M. Martin, of Malden, Mass.

Patent No. 459,448, for a telegraphic apparatus, held by W. E. Sloan, J. E. Hughes and O. S. Reed, of Chicago, Ill.

Business Notice.

The Central Electric Company are now distributing an extremely interesting treatise on the manufacture of the new silico vanadium steel alloy for use in transformer cores. This publication is fully illustrated, showing the method of manufacture from the actual mining of the ore, its progress through the steel mills and to the transformer itself. The publication will be found of value and interest to all those interested in the use of alternating current transformers. Anyone not receiving and desiring to possess a copy should write to the company for the same.

The Sandwich Selector.

The advertisement of the Sandwich Electric Company's selector will be noticed elsewhere in this issue. This instrument has proven a most efficient calling device for train despatching, and is an exceedingly simple form of selector, operating on the step-by-step principle, with all the working parts in full view at all times. It is speedy, as the average call can be made in three seconds, and is built strong enough to withstand any usage required of it. All contact points are made of platinum, assuring a certainty of a good battery connection to the bell. The flexibility of the selector is demonstrated more and more every day, as no new condition apparently has come up that it will not meet. In commercial work, also, this instrument can be used without any change whatever in its construction, and without the use of extra batteries at the sub-stations, and each sub-station will be enabled to call any other station. Any number of stations can be called by the despatcher, either singly, consecutively or collectively, and one or two bells can be rung at each station at the will of the despatcher. The despatcher's calling device occupies a space of but four by six inches, a saving of room that will be appreciated. Moreover, these selectors can be operated on any kind of line, either single wire or metallic, telephone or telegraph.

The Sandwich Electric Company is constantly enlarging its field of operations, fresh installations of the device being made on additional lines of railroads, while present equipments are being increased. The company makes an attractive proposition, inasmuch as it offers to install at its own expense a division for any road, the acceptance of which to be subject to approval. A new coil used in connection with their telegraphones has lately been devised which enables extraordinary results to be obtained from quadruplex wires, yet interfering in no way whatever with the balancing of the line. Descriptions more fully outlined will be furnished on request.

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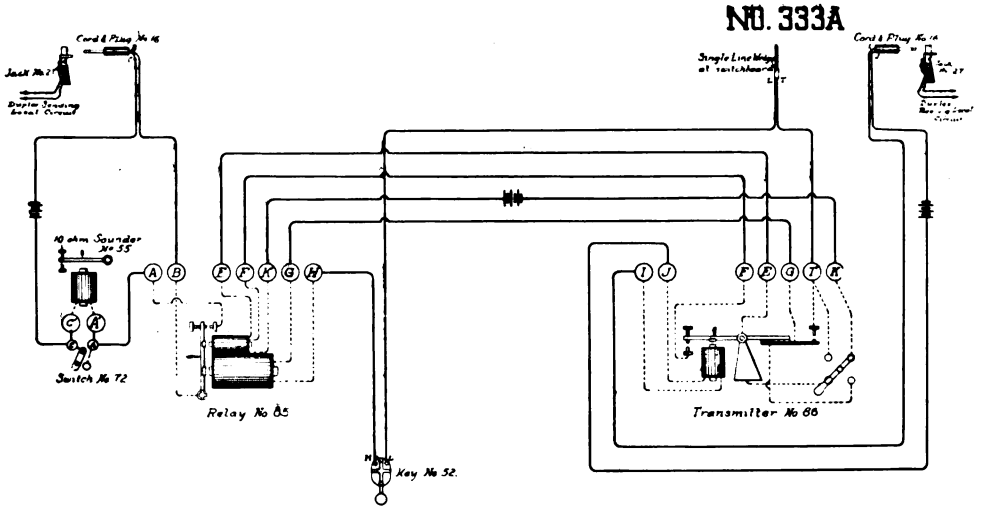
Postal Telegraphic Apparatus.

[Under this head there will frequently appear in Telegraph Age an illustration and descriptive account of some feature of the equipment of the Postal Telegraph-Cable Company, prepared by John F. Skirrow, associate electrical engineer of the company.]

The accompanying diagram shows the method of connecting up a Weiny half repeater to a duplex or one side of a quadruplex, where battery locals are used. Where such sets are installed it is customary to place the half repeater set upon a Morse table so that it may be used as a Morse set at the repeating office if desired. Additional local battery is placed in the local circuits of the half repeater to insure solid signaling. The connections between the Morse and multiplex sets are made at the switchboard by wedges and jacks as shown.



HALF WEINY REPEATER-BATTERY LOCALS

The Senlecq-Tival Method of Photo-Telegraphy.

A new method of transmitting photographs to a distance has been recently introduced by M. Senlecq and Tival. It is distinguished from the existing methods of Korn, Carbonelle and Belin by the fact that the actual transmission is only a matter of a few seconds instead of taking thirty or more minutes. This is an important improvement, in view of the congested state of most trunk lines. The high speed is attained in this case by first converting the actual photographic picture into a magnetic picture at leisure without using the line at all, and then transmitting the magnetic picture along the line when convenient and at a very high speed.

In this way the procedure is similar to that of the Wheatstone high-speed telegraph with its perforated paper strip. The Senlecq-Tival process starts with a bichromate gelatine photograph. This is impregnated with a metallic powder, in a way which is at present kept secret, until the variations of light and shade in the picture correspond with variations in electric resistance of the conducting surface of the picture. The variable resistance is made to cause the current from a constant-pressure local battery to vary. These current variations are recorded magnetically on a steel wire, as in the Poulson telegraphone. This magnetic record can then be stored away for any desired length of time, and can be employed to reproduce the current variation in a suitable circuit when required.

The speed at which the magnetic picture on the steel wire can be transmitted is considerably greater than that at which it can be impressed on the wire in the first case, and is only limited by the inertia of the receiving instrument. The latter consists essentially of a sensitive galvanometer, the deflections of which are magnified by a lever arrangement. The galvanometer actuates a small (1 sq. mm.) very thin film screen, which is shaded off from complete opacity to complete transparency by a micro-photographic process. In this way the light falling on a rotating disk from a Nernst lamp is varied in intensity in accordance with the deflection of the galvanometer. The disk is perforated with holes lying on a spiral. If the disk in the receiving station rotates synchronously with the telephone drum in the transmitting station, it is easy to see that the variations in illumination finally received on a photographic plate will correspond with those in the original photograph. It is not known whether any actual working results have as yet been obtained by this process.

If it were possible to still further reduce the time of transmission to, say, one-tenth of a second, it would be possible, owing to persistence of vision, to dispense with the photographic fixing of the received picture, and to view the picture direct on the screen, while it was being produced by the rapidly moving spot.—London Electrical Review.

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$2 a year.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part VIII.)

THE TRANSMITTER—CONTINUED.

The proper adjustment of the transmitter is a matter of great importance in connection with the operation of the printer system. Faulty transmitters may cause the received signals either to "line," "drop out," "clip" and "split" dashes, or to produce "false dots;" and as such defects may also be developed by imperfect adjustments of the receiver or recording instrument, it is no easy matter at times to fully determine to which of the various causes to be hereafter named the irregularities may be due.

The punched tape now gives little or no trouble, for with the advent of the new perforating machine already described, the "out of gauge" slip has practically disappeared, and with it one of the most prolific sources of impairment to automatic working that heretofore attended the operation of such systems. In the case of an imperfectly regulated transmitter the received signals may "line" if, (1) the tension of the spiral spring e^1 (Fig. 21)* on the marking needle, M, be too feeble; or, (2) should the vertical bar, L, be out of line with the center of the axis of the jockey roller J; or, (3) when there is too much tension on the jockey spring; or, (4) if the contacts be unduly prolonged on the negative (or marking) pole, as well as from (5) dirty contact points.

Signals will "drop out" as a result of the following causes: (1) The upright needles, M and S (Fig. 21) adjusted too far to the left, or too closely in line with each other; (2) upright needles too short; (3) dirty points on closed or negative pole; (4) too much play between the contact points; (5) improper adjustment of jockey spring; (6) lever L too much to the left of jockey roller's center, and (7) too prolonged a contact on plus or open pole.

"Clipped dashes" generally result from the spacing needle S being too long, or when lever L is adjusted to move too far to the left of the jockey roller's axis. "False dots" will be produced by collets C and C^1 being too close to the level, L, causing a "break" between the rocking beam pins p and p^1 and the levers A and A^1, thereby imparting a jerky movement to the vertical lever, L, when it ought to be at rest. The transmitter may be tested on "short circuit" for any of the faults mentioned by reversing the position of the switches S and S^1 (Fig. 27), which arrangement, it will be seen, destroys the previously established condition of "equilibrium" and forces the transmitter currents through the artificial side of the system only. The opening of the condenser circuits (C, C^1, C^{11}) at S^1 is necessary to obviate "bias" which would otherwise manifest itself upon the galvanometer under these conditions.

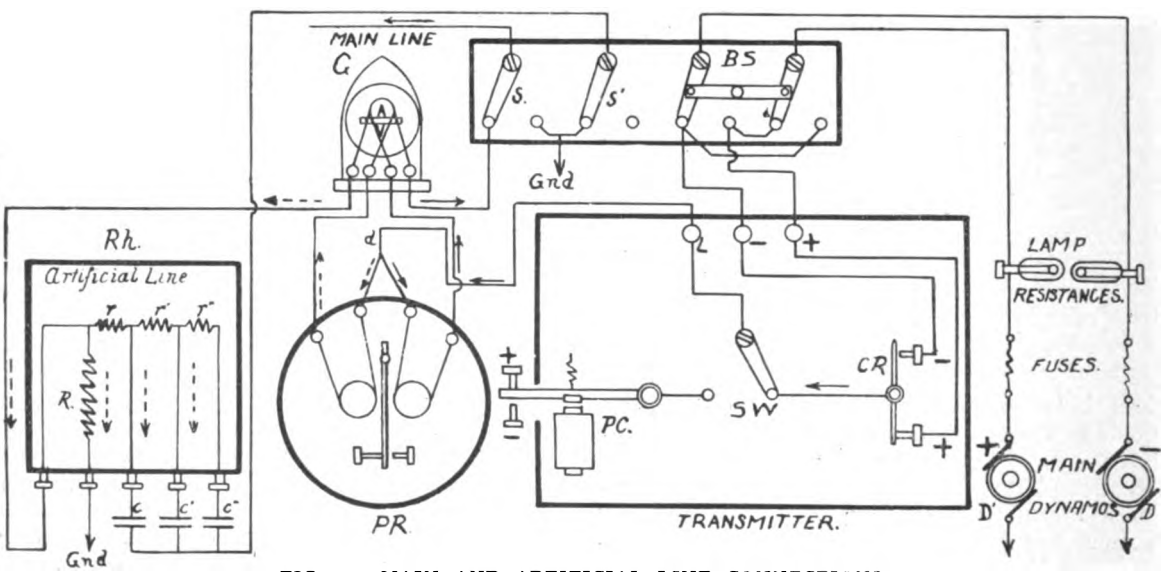

FIG. 27.—MAIN AND ARTIFICIAL LINE CONNECTIONS.

The main and artificial line connections for a terminal set of automatic duplex apparatus as arranged in the printer system are shown theoretically in Fig. 27. The difference between this arrangement and that of any ordinary duplex set consists in matters of detail only, the same general principles being involved in the working of both systems. The automatic portion of the apparatus is shown to the right of the transmitter, and consists of a current reverser (CR) that is mechanically controlled by the punched paper; while PC represents a pole changer constructed on the same principle, but whose operation is effected in the ordinary way by means of an electro-magnet and key, inserted in a local circuit. These two pole-changers are connected with the main line in such manner as to enable each one to separately transmit its own particular class of signals, when the switch SW is properly placed for the purpose of doing so.

* See September 1 issue of Telegraph Age.

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In the position illustrated in the drawing, a current from the plus pole of dynamo D^1 is represented as passing to line from the automatic side of the transmitter, its course through the apparatus being indicated by the continuous arrows, while the dotted ones represent the direction taken by that portion of the current which passes into the artificial circuit at the dividing point d. The latter circuit contains one each of the differential coils of polar relay, PR, and galvanometer, G, in addition to the resistance R in Rh, whose range is made sufficiently great to meet all the practical requirements of ordinary lines, and whose coils are nicely graduated with the view of enabling a good "ohmic" balance to be secured. A complete balance, however, cannot be fully established until the main and artificial lines are exactly alike both as regards their resistance and electrostatic capacity, this condition of equilibrium being indicated by the galvanometer, which remains perfectly insensible to the outgoing currents when these conditions are fully satisfied.

There is very little difficulty in finding a value in the rheostat Rh which shall practically represent the equivalent of the line resistance; but it is not so easy—especially on long and poorly insulated wires—to secure and maintain that condition of "static" equality between the main and artificial lines, which is so very essential to first-class working at rapid rates of speed. While the difficulties to be contended with are sometimes inherent in the wire itself as a result of its nature and surroundings, etc., they also arise from the fact that the galvanometer indications cannot always be relied upon as a guide in balancing the instrument, being more or less insensible to slight static irregularities that frequently affect the incoming signals. On this account the character or quality of the signals as noted upon the recording slip, will better serve the purpose and more clearly indicate the direction in which to secure the desired regulation. It will be observed that a series of condensers, C, C^1 and C^{11}, and a corresponding number of retarding coils, r, r^1 and r^{11}, are inserted in the circuit of the artificial line as a provision for securing as nearly as possible electro-static conditions in the artificial line corresponding with those present, or liable to arise in the main line.

When a current of electricity is first sent into a wire, a portion of the electricity becomes condensed on its surface by an inductive action that is progressive along the entire length of the circuit. When the battery contact is broken and the line is put to ground, the charge thus accumulated is set free, and becomes partially discharged through the wire as a "return current" in the direction of the sending station. If the conductor be very long, it will be obvious that a sensible period of time will be occupied in fully charging the successive portions of the wire, and that the "static" currents will encounter more or less resistance that will retard their rate of flow. Not only, then, must the conditions in the artificial circuit be made to agree with those on the main line so far as their respective "capacities" are concerned, but the time involved during the process of charging or discharging the main circuit must have a corresponding value during the similar operations in the artificial circuit, otherwise an inequality will exist that will manifest itself upon the galvanometer in the nature of a "kick," or more generally by the mutilation or distortion of the received signals.

Now the resistance R in rheostat Rh affords a means of producing the necessary equation so far as the simple "ohmic" resistance of the line is concerned; the condensers C, C^1 and C^{11}, furnish the required amount of electro-static capacity to compensate for the electro-static induction on the main line; while the resistances, r, r^1 and r^{11}, are introduced in the condenser circuits with the view of regulating the rate at which the various condensers charge and discharge through the artificial circuit, so as to correspond with the time occupied, or retardation encountered by the static currents which flow through the main line wire. By such means it is possible to artificially reproduce in the one circuit the various natural conditions existing in the other. The difficulty of so doing, however, generally increases with the speed of signaling, for a balance which may be sufficiently good for all practical purposes at low speeds, will oftentimes be found to be more or less imperfect, and to exercise a disquieting effect upon the received signals at high speeds. Hence the desirability of directing special efforts to the matter of static compensation on fast-working circuits, and of anticipating as far as possible the conditions most likely to be met with, so that the several equations may be fully secured with the least loss of time during the act of "taking a balance."

It will be well to understand in this connection, then, that the static accumulation in a line wire is usually greater at points near the sending office than at places more remote; and for this reason the series of condensers in the artificial circuit ought to be so graduated that the first of the series (C) should possess a condensing surface larger than that of the second (C^1), which in turn should be of greater capacity than the last of the series (C^{11}), whose position is at the greatest electrical distance from the source of power. On the other hand, the amount of resistance interposed in the inductive path of each condenser should be arranged in the reverse order, so as to allow the first condenser to discharge through only a comparatively small resistance (r); the second condenser through a larger amount ($r^1 + r$), and the third of the series through the maximum resistance ($r^{11} + r^1 + r$).

This disposition of the artificial retarding coils will generally be found to accord well with the amount of retardation ordinarily encountered by the static currents on the main line during their passage from one point to another over the various sections of the conductor. A very different kind of compensation would, however, be required in case the main line happened to be "patched" near the sending station with a long section of

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wire of much smaller gauge. With such an undesirable combination (which should never be made on printer circuits except in cases of emergency), the static flow on the main line would take place with less facility through the substituted section of wire, which, on account of its high resistance, would force more of the "static" to escape at, or near, the distant ground. On this account it would probably be found necessary as a compensation to reduce the number of sheets in the first condenser (C), and possibly also in the second condenser (C'), and to increase their retarding resistances r and r'.

A bad patch at the distant end of the wire would for opposite reasons call for more than the normal capacity, and perhaps less than the usual resistance on the part of the respective condensers and their retarding coils. For, as the "return current" would in this case flow more freely in the direction of the home station, an increase of condenser capacity would be needed on the artificial side to neutralize the greater effects of the main line discharge upon the home apparatus.

In view of what has been said, it will be obvious that had the patches at either end of the circuit been made with a wire of much higher conductivity than the regular conductor, the effects of the static discharges would have had to be neutralized by methods the reverse of those just described, inasmuch as the "static," like other currents, generally favors the paths offering the least resistance to their flow.

(To be continued.)

Personal.

Ali Galib Bey has been named director-general of posts and telegraphs of Turkey.

Baron Shimpei Goto has been named minister of communications of Japan, replacing Vicomte Masayasu Hotta, retired.

Mrs. Dunning, wife of J. E. Dunning, of Paterson, N. J., the well-known old-time telegrapher, suffered a stroke of paralysis on Sunday, September 13.

Mr. C. L. Bleakley, chief of the telegraph and telephone service, Panama Railroad, formerly at Colon, and now located at Culebra, in the canal zone, is in New York on his annual vacation.

Mr. W. E. Gilmore, who was formerly so prominently identified with Edison manufacturing interests, has just returned from Europe with his family, after a trip thither in search of rest and health. His plans for the future have not been announced.

Cavaliere Alberto Faranda, director of telephones and telegraphs in Rome, acting under the instructions of the Italian Minister of Posts, Telegraphs and Telephones, is in this country for the purpose of studying the best American telephone and telegraph methods.

Mr. John A. Sutherland, of Newark, N. J., a well-known forty-niner of the telegraph, was married on September 17, to Mrs. A. E. Chamberlain, of Englewood, N. J., and who herself is a former telegrapher, both being members of the Old Time Telegraphers' and Historical Association, and frequent attendants at the annual reunions.

Mr. P. J. Feeney, of Bangor, Me., accompanied by his wife, was a New York visitor last week and spent several days calling on numerous friends. Mr. Feeney was en route home from Niagara Falls, where he attended the reunion of the Old Time Telegraphers' and Historical Association, of which he is a member and a constant attendant at the reunions.

Mr. Frank B. Knight, of Dallas, Texas, a former well-known telegrapher and now special agent of the Southwestern Telegraph and Telephone Company, at the Texas address, was a recent New York visitor, while en route to the reunion of the Society of the United States Military Telegraph Corps, of which he is a member, at Niagara Falls, making his brief sojourn in the metropolis the opportunity to call upon numerous old friends.

Mr. Harvey P. Dwight, the venerable president of the Great North Western Telegraph Company of Canada, at Toronto, Ont., eighty years of age, and still hale and hearty, is one of the most valued readers of Telegraph Age. In renewing his subscription the other day he takes occasion to write: "I congratulate you once again in publishing such a useful journal of telegraph news. It would be difficult to suggest any change for the better in your management of the paper. Long may it prosper!"

A few days ago Frank C. Mason, former superintendent of the police telegraph in the Borough of Brooklyn, entertained a party of friends, gentlemen and ladies, including a number of telegraphers, at a clambake served in a grove on the premises of his country home, Glen Alex Farm, Washington Mills, N. Y. It was a unique and highly successful affair, even though given at a point far inland rather than at the ocean shore, in sight and smell of the salt water, where such repasts are usually supposed to occur.

Mr. J. F. Shorey, the well-known former telegrapher, who went to Portland, Ore., from New York in 1902, is now successfully engaged in business in that city, a number of different interests occupying his attention. He is president of the City Messenger Delivery Company, working in connection with the Postal Telegraph-Cable Company; president of the National Live Stock Insurance Association, besides being actively engaged in foreign exports. He is at present in New York, coming east on business connected with his Pacific Coast affairs.

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Western Union Telegraph Company.

EXECUTIVE OFFICES.

Colonel R. C. Clowry, president and general manager of the company, accompanied by his private secretary, F. J. Scherrer; Vice-President J. B. Van Every, General Superintendent Belvidere Brooks, and District Superintendent E. M. Mulford, attended the Niagara Falls reunion of the Old Time Telegraphers' and Historical Association and on their return stopped over at Rochester and Syracuse, visiting those places in the interests of the service.

Mr. Leonard Cox, traveling auditor of the company, has returned from his trip to Europe, whither he went on business connected with the service.

A large number of railroad telegraph superintendents were business visitors at the office of Vice-president G. W. E. Atkins during the past few days, among whom were noticed E. H. Millington, of the Michigan Central Railroad, Detroit; William Kline, of the Lake Shore and Michigan Southern Railroad, Toledo, O.; F. M. Brown, of the Pittsburg and Lake Erie, Pittsburg, Pa.; A. B. Taylor, of the New York Central Railroad, New York, and S. S. Colton, superintendent of the Rutland Railroad, Rutland, Vt.

Mr. W. W. Umsted, manager of the Omaha, Neb., office, and agent for the Telegraphers' Mutual Benefit Association at that point, has made an enviable record by securing twenty-eight applications for membership from the Omaha district, the result of a single canvass.

Mr. C. F. Annett, recently in charge of the office of the Western Union Telegraph Company at New Haven, Conn., who went West to assume direction of the same interests at Goldfield, Nev., has retired from the telegraph service to engage in the real estate business at Nampa, Idaho.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Edward J. Nally, vice-president and general manager of the company, who was in Chicago and St. Louis last week, on business connected with the service, will return to New York by the way of Atlanta, reaching his office on October 3.

Mr. Charles P. Bruch, third vice-president, who has spent the summer at Glen Cove, Long Island, going to and from business every day, has returned to his city home for the winter.

Colonel A. B. Chandler, chairman of the board of directors, who during the summer has made several trips between his country residence at Randolph, Vermont, where he is spending the season, and this city, sufficient to keep him in touch with business interests, will probably remain at his New England home until the middle of the month.

Mr. E. S. Butterfield, cashier of the company, and treasurer of the Serial Building Loan and Savings Institution, has returned to his office after a vacation, much improved in health.

Mr. S. B. Haig, superintendent of traffic, is absent from his office on vacation.

RESIGNATIONS AND APPOINTMENTS.

Mr. Charles F. Fox, superintendent of the eighth district of the western division, at Des Moines, Iowa, has resigned, the same to take effect about January 1.

Mr. W. E. Harrington, of the auditor's office, New York, has been appointed chief clerk to Superintendent G. W. Ribble, at Richmond, Va., vice George W. Phillips, promoted to be manager at Raleigh, N. C., where he relieves W. J. Crews, retired, on account of failing health.

Mr. F. H. Hollenbeck, of vice-president C. C. Adams' office, has accepted the position of cashier of the Indianapolis, Ind., office of the company.

F. J. Mahon, Canadian Pacific Inspector at Montreal.

F. J. Mahon, of Montreal, inspector of the eastern division of the Canadian Pacific Railway

F. J. MAHON,
Inspector, Canadian Pacific Railway Company's Telegraph, Montreal, Que.

Company's Telegraph, is a native of the city in which he resides, the date of his birth being September 18, 1865. He was one of the earliest of beginners in the telegraph, for he was but seven years of age when he entered its ranks. When nine years old he found employment with the Grand Trunk Railway at Coteau. So young a worker was deserving of success. Yet it was wise for him to quit work for a little while and devote time to his education, so from 1876 to 1881, he attended the Commercial Academy in Montreal. At sixteen he passed with honors the Canadian Government Civil Service Qualifying (or higher grade) examination. He then entered the service of the Canadian Atlantic Railway, leaving that company in 1886 to enter the employ of the Canadian Pacific telegraph, when that company began its commercial telegraph business. Since that time his progress has been rapid, a bright mind and fine personality aiding him in his upward march. He has filled the advanced positions of

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night chief at Montreal, chief operator at St. John, N. B.; manager at Quebec, chief operator at Montreal, the appointment to his present position of inspector of the eastern division occurring in August last.

J. F. N. Caisse, Canadian Pacific Chief Operator at Montreal.

J. F. N. Caisse, chief operator of the Canadian Pacific Railway Company's Telegraph at Montreal, was born at Lachine, Que., in 1862. At the age of twenty he became an operator in the employ of the Great North Western Telegraph Company, at Montreal. Five years later, in 1887, he entered his present service, beginning as an operator. In

J. F. N. CAISSE,
Chief Operator, Canadian Pacific Railway Company's Telegraph, Montreal, Que.

1897 he received promotion to the position of assistant chief operator, from which, in 1899, he was advanced to that of night chief operator. In 1903 he became wire chief, and in this current year of 1908, received further elevation to the office of chief operator, succeeding F. J. Mahon, made inspector. Mr. Caisse is a careful and painstaking telegrapher, and has given to his profession much study and thought.

The Cable.

Mr. George G. Ward, vice-president and general manager of the Commercial Cable Company, New York, accompanied by Mrs. Ward, arrived in New York, Friday, September 25, from Europe, on the steamer Baltic.

Mr. A. Cunningham, of the Commercial Cable Company's staff, at Hazel Hill, N. S., who was married on September 9 to Miss Louise Gerrard, daughter of Superintendent F. B. Gerrard, at that point, is visiting in New York with his bride.

Mr. Robert L. McCann, for twenty-six years in the service of the Mexican Cable Company, and twenty years manager of the Galveston, Texas, office of the company, has been appointed general manager of the Mexican Telegraph Company and the Central and South American Cable Company, with headquarters in New York. Mr. Alfred T. Webster, who entered the service with Mr. McCann, and who has been assistant manager of the Galveston office for many years, has been promoted to its managership.

Cable communication was interrupted September 28 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Lanzorote (Canaries)	May 18, 1908

Messages go by steamer from Las Palmas.

Macao	Aug. 29, 1908

Messages can be mailed from Hongkong.

We are in receipt from Mr. Oscar Moll, general manager of the Deutsch-Atlantische Telegraphengeselleschaft, Cologne, Germany, of a series of post-cards, illustrative of cable-laying incidents, showing the Agamemnon and the Great Eastern, notable for their connection with the first Atlantic cable, and different views of the German cable steamer Stephan, engaged in laying German cables of a later period. A view of the waterfront at Emden, the great cable port of Germany, is included in the set of six pictures.

The new German cable company mentioned in this column September 16, will be known as the German-South American Telegraph Company, Limited, and will have its headquarters at Cologne. The intention is to lay and operate submarine cables from Germany via Teneriffe or Liberia to Brazil and to the German colonies in West and Southwest Africa. Subsidies, which the German government has consented to grant, will ensure the payment of interest and sinking fund on the bonds to be issued by the company, as well as a sufficient rate of interest on the share capital. It will be remembered that Messrs. Felton and Guilleaume, in May of 1907, obtained a concession from the Spanish government to land a cable at Teneriffe on condition that it stretched direct from Emden to that island without touching at any intermediate point. This reservation was apparently made to safeguard the interests of the British companies whose cables land on Spanish territory, and although it involved the laying of a much heavier type and greater length of cable than was anticipated by the German company, the condition was accepted. In 1902 it was rumored that Germany was planning the laying of cables from the Azores to Dutch Guiana in order to be free of dependence on English wires in time of war. In view of the Dutch-German joint cable enterprise in the Far East this scheme was looked upon as probable. The Western Telegraph Company laid a cable from St. Vincent to Fayal in 1906, thus enabling their traffic to be despatched more expeditiously to America. It has been stipulated that two-thirds of the board of directors must be of German nationality and must reside in Germany. The electrical manufacturing firm of Felten and Guilleaume, who originally obtained the concession and passed it on to the new company, will supply and lay the new cable. Negotiations are in progress with the Brazilian government with regard to laying the first cable.

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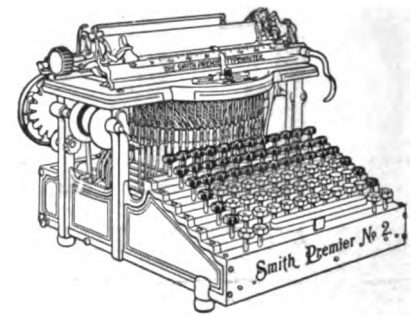

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OCTOBER 1, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Further Considerations of Importance.

We have received from a correspondent the following letter, to which we invite attention, particularly of young operators, and we request also that our remarks which succeed it, be carefully read:

I was an interested reader of your editorial reply in the September 16 issue, to the letter of a correspondent, under the title of "An Important Question Considered." Of course, theoretically I accept much of what you say to be true, but differ with you when you state that every operator has it in his power to better his condition within the limits of the telegraph service. That I don't believe. If it were so there would not be enough places "higher up" to go around. I can't see wherein the telegraph, with its insufficient pay, offers any attractions to men who are ambitious. I consider myself at thirty years of age, a pretty fair operator, but there is no promotion in sight that I can make out, and that being the case I may ask, "What's the use?"

The sympathies of TELEGRAPH AGE have ever been, and are, with the men at the key, of which our correspondent subscribes himself as one. And it is on account of this sympathy, broad and deep, inherent because born of association, ripened by the friendships of years, and heightened by personal knowledge of conditions that environ not alone operators themselves, but affecting every department of the service, that in its ardent wish to see the standard of the personnel advanced, this paper has rung the changes in its advocacy of the need of personal effort and study on the part of telegraphers, especially young men, in order to equip themselves for and correlatively to ensure advancement in life. We have said repeatedly, and for years, that if individuals would conscientiously follow this advice, the reward of promotion would surely come to them. This is no fantastic remark. It has been illustrated in the lives of thousands. History proves it. The records of the service prove it. It is a truism easily verified. The statement as repeated here is not uttered in a perfunctory way or in a light vein. Industry in any vocation, in whatever is undertaken, application, the formation of studious and correct habits, resulting in the ability to do things, thus meeting the demands of employing interests as they exist to-day, will eventually land any man, we don't care who he may be, in advance of where he now is.

The great trouble, however, is that so many men are content with being mediocre. They would like position and emolument, and dream dreams of its acquisition, but exercise no really practical effort to reach the goal. If they were to be charged with being lazy the imputation would probably be indignantly resented. Yet if they would carefully and with honest purpose analyze their own character, we think that the easy life, the unwillingness to assume responsibility, the proneness to pass around and evade duty instead of zealously tackling, overcoming and mastering difficulties — the problems that continually confront one, would be admitted. The pinch comes when exertion is necessary. It must be admitted that if we are not willing to exert ourselves, not once or twice only, but persistently, failure must inevitably be the result. And that is just exactly the trouble with so many who complain of their condition in life. The telegraph holds no monopoly in this respect.

The telegraph service may not be all that is ideal; that phase of the subject we are not discussing; but so long as it lasts it will continue to hold a prominent place as a great industrial field of employment, and plenty of men will so acknowledge it by accepting what it has to offer, many from choice, some, perhaps, because of accident. But whatever the reason there they are, that is their employment; positions held from which a living is derived, positions which were sought and occupied with a full understanding of their limitations and possibilities. We think it ungracious, therefore, to find fault with what has been deliberately chosen.

The compensation of an operator is not large; attractive perhaps to the youth, but no longer

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inviting to the man of mature years. Yet the amount of wage is the going rate, and was not accepted, probably, without due consideration. It may or may not be all that the telegraph can afford to pay. That, also, is not the question under review. The question is that, having agreed to certain conditions, it is one's duty to accept the impositions attached thereto. If the individual be made out of the right stuff he will not grumble, even if not satisfied. If believing that he can and ought to do better, and the telegraph business is to his liking, he will pull himself together and with manly grit and earnest endeavor set himself to work out from this lower to a higher place. He must prove his ability.

We say to our correspondent that the ambitious man, whether in the telegraph or out of it, can, if he will, advance his fortunes. Don't entertain the idea for one moment that there is not waiting for you, and for all who will, a place somewhere in the telegraph service above your present position at the key if there be shown the capacity to fill it. Individual ability is the crying need of to-day. Ask anyone in authority in any field of endeavor and ponder over the answer you will receive. Go with your query to men like Colonel Clowry, the president and general manager of the Western Union Telegraph Company; to Mr. Nally, vice-president and general manager of the Postal Telegraph-Cable Company; to Mr. English, the general manager of the Postal Telegraph-Cable Company of Texas, practical, self-made men, each of them, men of wide acquaintance, large experience, and broad sympathies, and get their answer. They will tell you of the extreme difficulty experienced in finding men to fill the multitudinous places of responsibility within the gift of the telegraph.

Another thing: don't rest satisfied with being a "pretty fair operator." Become the best. "What's the use?" you ask. Because your manhood is at stake, it is undergoing trial; your future is held in the balance. If you have intelligence, sufficient health, proper force of character, your future so far as worldly advancement in some degree is concerned, is absolutely in your own keeping. If promotion does not come just when you think it ought to, don't be foolish enough to ever again say, "What's the use?" Be patient. Watch, and wait and work. If your opportunity, for any reason, does not come in the telegraph service, you may grasp it in some other line of employment. It should not be forgotten that the telegraph has graduated some of the ablest and most successful executive men of the nation. It embodies to-day in its wide-reaching service a splendid industrial working force, and from out of its lowest ranks a future staff of responsible telegraph workers must eventually be evolved. No one, then, should disparage his position, whatever it may be. In so doing he is discounting himself: he is casting moral obliquity upon himself. Rather should a practical education be derived from his occupation. It can be made the stepping-stone to something higher and better, whether in the telegraph or otherwise.

As we have often pointed out, this is becoming more and more a technical age. The man best equipped with knowledge becomes a power, a desirable factor in the order of business economy, and goes to the top; superficial perception keeps him down.

We urge with all the earnestness of which we are capable, that operators, particularly young men with life before them, give these thoughts heed. All effort entails work; successful effort implies the execise of mental force. Strive for ethical ideals.

Telegraphers or Writers Cramp.

A correspondent writing to the Telegraph Chronicle, of England, respecting telegraphers or writers cramp, a trouble more prevalent, by the way, among telegraph operators in Great Britain than in this country, comes to the conclusion that the "cramp" is not a disease, nor is it, he says, a nervous disorder. Rather it is, he goes on to state, "an affliction, the primary causes being insufficient training—incorrect style, and the sacrifice of accuracy to speed. Contributory causes are bad quality, hard pencils, manifolding, etc. I think a large number of clerks signally fail to discover how to send with the least effort, consequently they abuse the muscles of the forearm, with the result that the elasticity of youth is prematurely superseded by the whipcord of old age.

"With proper training it is possible for learners to acquire a style by which the power to send is evenly distributed from the fingers to the shoulder, never allowing the muscles of the forearm to be rigid. It is not necessary to grasp the key in order to send fifty messages an hour. The arm should be kept almost horizontal from the fingers, second joint to the elbow, with the first joint holding the key lightly.

"The strain to make a good copy with the present soft, cindery pencils, together with incorrect style, poor carbon paper and thick top copy is, I submit largely responsible for the increase in the number of cases of 'cramp' in the service. Of course, the youth who rushes, for self-glorification, to endeavor to get off seventy or eighty messages an hour receives his reward when prematurely placed hors de combat."

The question having arisen as to the probable number of colored operators employed in the telegraph service in America, it may be stated with approximate accuracy that upwards of fifty are thus engaged in the United States and Canada, distributed in both the commercial and railroad services.

The testimony of progressive operators is that TELEGRAPH AGE is so thoroughly comprehensive in character as to make it absolutely indispensable to those who would keep informed. Its technical articles are of high practical value. Write for a free sample copy.

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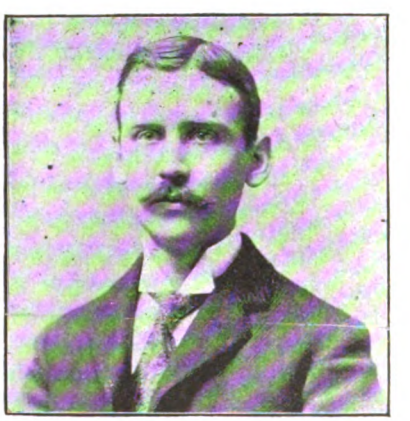
The Meeting of the Old-Time Telegraphers' and Historical Association and of the Society of the United States Military Telegraph Corps.

The twenty-seventh annual reunion of the Old Time Telegraphers' and Historical Association, and the Society of the United States Military Telegraph Corps, held at Niagara Falls, N. Y., with headquarters at the Cataract-International Hotels, on Wednesday, Thursday and Friday, September 16, 17 and 18, will be remembered as one possessing peculiar and exceptional interest, inasmuch as

ELGIN B. SAYLOR, PITTSBURG.
President-Elect, Old Time Telegraphers' and Historical Association.

the nearly two hundred persons present embraced so large a number distinguished in the profession which they represented—so many who had participated in the actual scenes of the Civil War, incident to the employment of the telegraph therein. It was a reunion of old timers in the truest sense, and as such had imparted to it an atmosphere of delightful comradeship not often experienced, and which will live long in memory. The annals of the joint organizations have been notably enriched by this meeting. Much had been accomplished by the various committees appointed for the occasion looking to the reception and having in view the comfort and pleasure of the visitors during the three days of the reunion. How well all plans were carried out was reflected in the abundant expression of thanks for attentions bestowed and favors conferred. Harvey D. Reynolds, president of the old timers' association, proved himself to be an admirable "host in chief," and exhibited qualities of executive abilities that won for him unqualified approval. With fine weather, in the meeting of old friends, and in the carrying out of a programme of entertainment, enacted without drawback or flaw of any kind, the attendants at the reunion had cause only for rejoicing. It was a fine affair.

The business meeting of the Society of United States Military Telegraph Corps was held at the Cataract hotel at eleven o'clock on the morning of Wednesday, September 16, Colonel William B. Wilson, president, occupying the chair. After the reading of the reports of the president, and of the secretary and treasurer, the secretary, Mr. D. H. Bates, who furnished a printed copy of the constitution and by-laws containing all amendments made since 1882 down to the present time, all of which were adopted, the attention of the society was directed to the business of a miscellaneous character before it. Mr. J. H. Robinson, of Washington, in referring to the deeds of the military telegraphers performed during the Civil War, paid a warm tribute to their intelligence, their valor, their patriotism, and the value of their services rendered. He quoted the words of General Locke of the Army of the Potomac, who said of the military telegraphers, that he "used them in saving the lives of thousands of his men, halted in line of battle, while the telegraph operator, who was familiar with electric explosives, was sent ahead to discover and explode the numerous torpedoes that frequently were buried in camps evacuated by the enemy." He related the



CHARLES E. BAGLEY, PITTSBURG.
Vice-President-Elect, Old Time Telegraphers' and Historical Association.

pathetic incident of the bright young operator, D. B. Lathrop, who was blown up by the exploding of a Confederate torpedo at Yorktown.

It was resolved that all persons eligible to membership may be elected to life membership by the payment of fifty dollars, in which case the payment of annual dues will not be required.

In behalf of Colonel Robert C. Clowry, president of the Western Union Telegraph Company, and a member of the executive committee, who did not reach the reunion until the succeeding day, the secretary read the following resolution, which was adopted:

Whereas, The wise philosophy and broad philanthropy of our comrade Andrew Carnegie, never found

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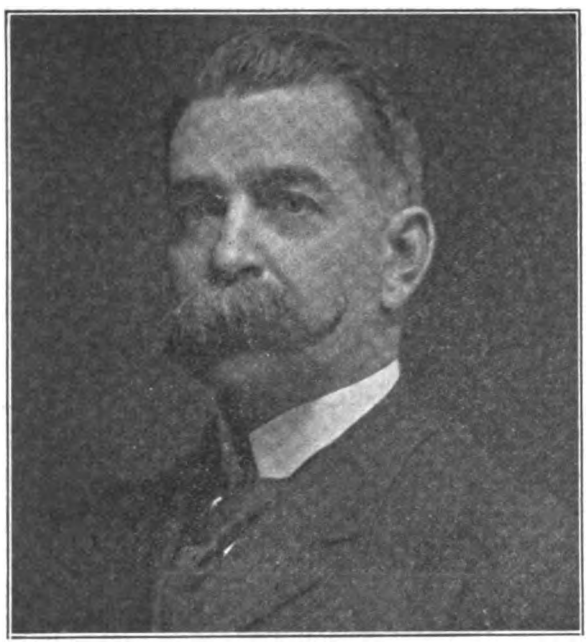
a more significant expression than when on December 16, 1907, he voluntarily made provision to meet the wants of the aged and needy members of our corps, and

Whereas, His bounty has brought unexpected comfort to some of our members on their death beds and to others whose declining years have been attended by more or less physical suffering. Therefore, be it

Resolved, That the Society of the United States Military Telegraph Corps, of which Andrew Carnegie was one of the founders, at its twenty-seventh annual



WILLIAM J. CAMP, MONTREAL, QUE.
Vice-President-Elect, Old Time Telegraphers' and Historical Association.

reunion, records its high appreciation of him not only as a comrade but as a man whom the whole world recognizes as a leader among the higher types of men.

Another resolution which in its adoption was ordered to be prepared in such manner that all the members could sign it, and forward to Mr. Pettit, to whom it related, read as follows:

Resolved, That the voluntary resignation of James E. Pettit as secretary and treasurer of this society, after twenty-six years of faithful, unselfish and devoted service on his part, has been received with deep regret, and in accepting it the society tenders him this expression of high appreciation and regard and the warmest love of all members; may he live long and continue in the future as in the past, a type of that manhood which constitutes true brotherhood and humanity.

The following telegram was sent to Theodore Roosevelt, President of the United States, signed by William Bender Wilson, president, and David Homer Bates, secretary:

The surviving members of the United States Military Telegraph Corps which served in the Civil War, now in annual reunion at Niagara Falls, recognizing and highly appreciating your great services to our beloved country, and regretting your inability to be present with them, greet you with admiration, loyalty and love.

To this message the following reply was received from William Loeb, Jr., secretary to the President:

The President thanks you for your messages, and in return sends his greetings and best wishes for the United States Military Telegraph Corps.

To Andrew Carnegie, at Skibo Castle, Scotland, a message was sent as follows:

Survivors United States Military Telegraph Corps Civil War, in annual reunion at Niagara Falls, send loving greetings to their first chief. All hail Columbia and Scotia!

To General Thomas T. Eckert, this message was sent:

The surviving members of the United States Military Telegraph Corps, of which you were so long the distinguished head, are now in annual reunion at Niagara Falls, and in grateful remembrance affectionately greet you.

To the Hon. Cyrus Sulloway, Manchester, N. H., member of Congress, a telegram reading as follows, was transmitted:

The surviving members of the United States Military Telegraph Corps, which during the Civil War developed a high standard of soldiery and demonstrated to the armies of the world that Morse telegraphy was an invaluable arm of military service to operations in the field, are in annual reunion at Niagara Falls and, appreciating your services to the country, both as soldier and statesman, wish you a long and happy life and hope that at the next session of Congress you may see your way clear to aid in having done for them the justice they have so long been pleading, and to

FRANKLIN J. SCHERRER, NEW YORK.
Secretary-Elect, Old Time Telegraphers' and Historical Association.

which they are entitled by their standing and acts in that Grand Army of the Republic which conquered secession and established a great nation.

Additional telegrams were dispatched to United States Senator N. B. Scott, Wheeling, W. Va.; United States Senator Boise Penrose, Philadelphia; Hon. Joseph G. Cannon, Speaker of the House of Representatives, and Hon. William Lorimer, member of Congress from Chicago.

A letter was read from Melville E. Stone, general manager of The Associated Press, New York, expressing regret at his inability to be present.

In the election of officers for the ensuing year, with former president William R. Plum, of Lombard, Ill., in the chair, William B. Wilson, of Phila-

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delphia, was continued as president; David Homer Bates, of New York, secretary and treasurer; William L. Ives, of New York, and Charles A. Tinker, of Brooklyn, N. Y., vice-presidents.

The chair reappointed the executive committee, and also the committee on Congressional action. General Thomas T. Eckert and Colonel Robert C. Clowry were elected honorary members of the society.

Mr. A. H. Bliss, of Chicago, presented the president and secretary each with a tin cup, such as was used at a little dinner recently given in Chicago.

The wires, as is customary at like occasions, of both the Western Union and Postal telegraph companies, were placed at the free disposal of the military telegraphers.

The business meeting of the Old Time Telegraphers' and Historical Association, following that of the military telegraphers, convened in the Cataract Hotel, at two o'clock on Wednesday afternoon, September 16. Harvey D. Reynolds, the president, called the meeting to order and introduced Franklin D. McKenna, corporation counsel of the City of Niagara Falls, who, speaking in place of the Mayor, who was out of town, welcomed the visitors to the city, tendering them its freedom. William J. Dealy, of New York, spoke in reply.

President Reynolds then addressed the association. He referred to its former meeting at Niagara Falls, occurring as far back as 1882, then went on to speak of the wonderful development and the vast applied uses of electricity at that point, the initial spot from which a wide reach of surrounding country derived its power. He referred feelingly to the death of former president William Hamilton Young, and of Secretary John Brant, reading extracts from obituary notices of both that appeared in TELEGRAPH AGE. His remarks were well received.

M. J. O'Leary, of New York, who was appointed to act as secretary pro tem, read the report of the secretary and treasurer.

Letters were read from Colonel R. C. Clowry, president and general manager of the Western Union Telegraph Company; E. J. Nally, vice-president and general manager of the Postal Telegraph-Cable Company; from James Kent, general manager of the Canadian Pacific Railway Company's Telegraph, and I. McMichael, general manager of the Great North Western Telegraph Company, tendering to members the free use of the wires of their respective companies, during the meeting of the reunion.

Clarence H. Mackay, president of the Postal Telegraph-Cable Company, New York, sent the following letter to President Reynolds, which was read:

Thank you very much for your invitation to attend the convention of the Old Time Telegraphers and Historical Association, to be held at Niagara Falls, September 16 to 18. I am a little afraid that my duties here will tie me down and prevent me from attending. I assure you that it would give me great pleasure to see you all and meet with you. I think these conventions are splendid things. They bring us all together once a year for social and friendly intercourse, which otherwise would not be possible in this busy every-day whirl of business life. If I am unable to attend I hope you will extend to the members, many of whom I know and value as friends, my very best wishes for a happy and successful meeting.

Letters were also read from E. J. Nally and C. C. Adams, vice-presidents, and Colonel Albert B. Chandler, chairman of the board of directors, of the Postal Telegraph-Cable Company, expressing regrets at their inability to be present.

George C. Maynard, assistant curator of the department of technology, Smithsonian Institution, Washington, and a former president of the association, sent this characteristic dispatch:

Out of a busy, active, hard working day, full of vigor and spirit, I send cordial greetings to all you superanuated decrepit old fellows, who are only able to enjoy quiet picnics with the girls.

In the nomination for officers the following were named: E. B. Saylor, president, and C. E. Bagley, first vice-president, of Pittsburg; W. J. Camp, second vice-president, Montreal, Que., and M. H. Kerner, secretary, New York. Mr. Kerner withdrew his name as secretary, and that of Frank J. Scherrer, of New York, was substituted therefor. The ticket as then altered, was duly elected. On motion the salary of the secretary was reduced from $600 to $250 a year. Pittsburg was selected as the place of meeting in 1909, at a date yet to be determined upon by the executive committee.

The hold-over members of the executive committee are: Harvey D. Reynolds, of Buffalo; John C. Barclay and Charles C. Adams, of New York, and C. J. Fry of Milwaukee; the other five members to be appointed by President-elect Saylor.

Motion was made and carried that the secretary of the association prepare suitable minutes to be incorporated in its permanent records in memory of the late John Brant, the former secretary. The motion was supported by the remarks of Colonel William B. Wilson and William L. Ives, president and vice-president, respectively, of the Military Telegraph Corps, who dwelt with much tenderness, speaking in terms of endearment on the life and character of John Brant as exemplified in his relations to the association and to its individual membership.

On the adjournment of this meeting at four o'clock in the afternoon, the entire delegation started out on a tour of sight-seeing, beginning the itinerary that had been arranged for their entertainment. The first thing done was to proceed to the plant of the Shredded Wheat Company. This vast establishment was carefully inspected, the visitors being conducted to every part of the property, and the process of manufacture explained, the examination proving to be highly instructive and of decided interest. Before taking their departure a "demonstration" luncheon was served to the guests. The day concluded with a reception held in the ballroom of the Cataract Hotel. Music enlivened the occasion, and the large attendance throughout the hours of the evening attested to the pleasure felt by those present.

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In accordance with a prearranged plan, every detail of which had been carefully ordered, a delightful programme was carried out on Thursday, September 17, which in its execution consumed the entire day and evening, crowding the hours full with pleasurable events. At nine o'clock in the morning, the excursionists assembled to accept an invitation for an extended trip over the route of the Niagara Gorge Belt Line, an electric line of railway, extending on both sides of the Niagara River, from the falls to a point near its opening into Lake Ontario. The river scenery along this road was especially fine, and as private cars were provided in which to convey the guests, enabling numerous stops to be made at the principal points of interest, the trip was rendered an exceptionally enjoyable one. This was terminated on the Canadian side at the Brock monument, a tall shaft at a point commanding an extended view. This monument was erected to the memory of Lieutenant General Sir Isaac Brock, a brave British officer who fell at the battle of Queenston, October 13, 1812. At this point a lunch was partaken of under the trees, the same being furnished by Messrs. Suesse and Powell. This refreshment concluded, a further stop of half an hour or more was had for purposes of rest and social recreation. A group was noticed which embraced numerous well-known personages of the telegraph, who, yielding to the influences of the hour, disported themselves with the joyous good nature and abandon of youth and with familiarity of address, which resolved itself in one instance on the part of an old veteran into "Bob" Clowry when made in greeting the chief executive officer of the Western Union Telegraph Company, for it was plain "Bob" in the long ago. Others observed in the group besides Colonel Clowry, were J. B. Van Every, vice-president; Belvidere Brooks, general eastern superintendent, and E. M. Mulford, district superintendent, all of New York, who represented the Western Union executive offices; Harvey D. Reynolds, district superintendent of the Postal Telegraph-Cable Company at Buffalo, who may be said to have stood for the executive offices of his company; I. McMichael, of Toronto, vice-president and general manager of the Great North Western Telegraph Company; W. J. Camp, of Montreal, electrical engineer, and P. W. Snider, of St. John, N. B., superintendent at that point of the Canadian Pacific Railway Company's Telegraph, represented their respective interests on this occasion. Included also in this circle were a number of forty-niners of the telegraph, among them W. G. Brownson, of Toledo, O.; Nathaniel Hucker, of Buffalo, and J. A. Townsend, of Yonkers, N. Y. Then there were George M. Dugan, of Tip Top, Ky., formerly and for many years superintendent of telegraph of the Illinois Central Railroad system; George T. Williams, at one time superintendent of the Western Union Telegraph Company, at Cincinnati, O., and later superintendent of telegraph of the Nickle Plate system, now living in retirement at Cleveland, O.; David Homer Bates, and Charles A. Tinker, both of New York, the two members present of the noted "sacred three." The incident of this accidental coming together was noticeable and afforded a pleasing episode in a trip that abounded with agreeable features. The hearty commingling of these men afforded new proofs of the spirit that binds comradeship.

The party of excursionists proceeded down the river by steamer to the lake, stopping at the town of Niagara, thence returning by boat to Lewiston, on the United States side, where special cars awaited the coming of the travelers, the trip was made to Niagara Falls.

In the evening occurred the banquet at the International Hotel, of which a full account is herewith subsequently given.

Of course the Falls of Niagara alone constitutes an object of interest sufficient to rivet and hold the undisturbed attention of visitors without reference to anything else that may be worthy of attention. But the committee of arrangements were alert to bestow every consideration of attention upon their guests, so it was that at half past ten the next morning, Friday, September 18, many large automobiles were in readiness to take the delegates sightseeing to the many points of interest that abound at Niagara and vicinity. Accordingly they were rapidly taken about from place to place, visits being made notably to Goat Island, Three Sister Islands, and the State Reservation, an extensive and beautiful park. This consumed the morning hours. In the afternoon a visit to the famous electrical power plant was made. This inspection closed the round of sight seeing and marked the end of the reunion of 1908, which will take its place as one of the most successful and intrinsically delightful in all of the long series. It served to renew and cement many acquaintances begun, some of them at the time of the Civil War, and even preceding that date. Members said good-bye each to the other with reluctance, with a warm grasp of the hand and frequently with moistened eyes, for who could tell when they should meet again!

This account would not be complete without paying tribute to the efficiency and good will displayed by the local committee of Niagara Falls, consisting of W. J. Martan and Mr. and Mrs. F. S. Lewis, who rendered material assistance to the Buffalo committees in carrying out the established programme. Mr. Martan is manager of the Postal Telegraph-Cable Company, and Mr. Lewis is manager of the Western Union Telegraph Company, at Niagara Falls.

Others of whom particular mention should be made for their zeal in contributing to the pleasure of guests, were the following from Buffalo: Messrs. L. M. More, G. A. Burnett and W. A. Sawyer; Mesdames H. D. Reynolds, W. L. Stowe, L. M. More, and G. A. Burnett, and Miss Carrie D. Reynolds.

A double quartette made up from the Guido Chorus of Buffalo, added much to the enjoyment of the reunion by their very acceptable singing.

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The banquet on the evening of Thursday, September 17, at the International Hotel, was a notable affair. About two hundred persons sat down to numerous small tables which were grouped about the room. After the coffee had been served the speechmaking began, Harvey D. Reynolds, the retiring president of the Old Time Telegraphers' and Historical Association, introducing Colonal William R. Plum, of Lombard, Ill., the historian of the military telegraphers, who acted as toastmaster. In his opening address he referred to the early history of the Old Time Telegraphers' Association, citing its first meeting at Cincinnati twenty-eight years ago, of its meeting the next year at Niagara Falls when the then newly-organized Society of United States Military Telegraph Corps met with it in joint assembly, a practice that has since been maintained. The death of President Garfield caused the regular meeting of that year to be postponed, as was also that of last year, deferred on account of the striking proclivities of some of the telegraph operators.

It is said, once a telegrapher, always a telegrapher. This idea is illustrated in Mr. Plum's case, who said: "I like to go into a telegraph office and listen to the sound of the instrument, for though I have not telegraphed to speak of for forty years, I believe I can read by sound as well as ever. While there was a time when I thought I knew about all there was to be learned in connection with the telegraph, I find as the years grow upon me I know almost nothing. Only a short time ago I was introduced to Mr. J. C. Barclay, in New York, who has invented an instrument that bids fair to do away in a large measure with the telegraph click. And sometimes I imagine that other improvements will follow until eventually the manipulation of the key will no longer be required in message sending." In concluding his remarks in facetious vein he introduced Mr. William J. Dealy, of New York.

Mr. Dealy, who was one of the best known of military telegraphers serving the army in the field during the Civil War, and who is now the superintendent of the Commercial News Department of the Western Union Telegraph Company, New York, said in part:

"There is nothing in history that offers a fitting comparison to the military telegraph corps in the important part it played during the war for the Union in the years between 1861 and 1865. The telegraph was then in its infancy. It had been in existence only seventeen years, but the impetus to its development given by the boys on those army lines, has made it a giant factor for all time in shaping the history of the world's progress. Would that I might—that I could—describe the scenes of those years that are still so vivid to me. I recall one fellow, while the bullets were being fired at him, who coolly dug them out with a jack knife from where they lodged and put them in his pockets, preserving them as mementoes. You remember that incident. Parker Spring, the Washington operator, telegraphing from a balloon, made charts of the enemies' camps, numbers and positions. Remember, that was forty-seven years ago. J. Hervey Nichols, now of Denver, occupying an exposed position midway between contending armies, perched aloft on a cracker box in order to reach the wires, filled it with the music of his Morse utterly fearless of danger, another instance of devotion to duty and of personal bravery. And then there were the "sacred three," deciphering cryptograms, thereby saving from destruction by fire the city of New York and the ships at sea from being shattered by explosion; we also remember A. H. Bliss, of Chicago, suggesting and advocating plans insuring victory, growing out of his knowledge of the situation; equally clear in our mind is the army general who, in ignoring the wise admonishment, was captured with his entire brigade. All these military telegraphers mentioned were boys at the time, boys in their teens.

"There was another who had passed into his twenties; never satisfied unless on the firing line, eager bravely to advance it, engaging in the fiercest battles—he, too, a boy, yet a man. Colonel Robert C. Clowry gained his military rank and title, not in the office, but on the field of battle.

"Sons of the corps, treasure these truths and be inspired by them. Let me mention still another. When the peace commissioners were at Hampton Roads, I went out in the night from Fortress Monroe to personally deliver on a steamer to Hon. Edwin M. Stanton, Secretary of War, a message which I had received and deciphered for him. After reading the message he placed one of his arms around me. He seemed to sway with emotion. His eyes were moist. His voice was filled with tenderness and affection. He held me as a father would hold a son, and using me as a medium, he paid to the intelligence and loyalty and the bravery and efficiency of the United States Military Telegraphers this sublime and monumental tribute: 'I look upon the telegraph as my right arm. I love you telegraph boys.'

"Remember, boys, sons of the corps, that no one member of that corps had a college education, nor were any of them favored, as you are now, with the advantages that are crowding upon you. Very few had little better than a short time at school of any kind. But they had zeal and enthusiasm; they had grit; they had character; they had ambition; they had patriotism, so intense that there are not words in any language that can describe or define it.

"Colonel Wilson said yesterday that some of the boys were getting old. There is no such thing as age among military telegraphers. There is no such thing as age among old timers. The very forces with which we are engaged keep us forever young.

James Merrihew, who was introduced as a gentleman who had "turned his attention to fishing

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and with such pronounced success that he actually caught a sea gull on the fly," said:

"I think that an unfair advantage has been taken of me. It is well known that I am unable to address an audience. If Charles Tinker had not already told that sea gull story I would tell it. It is like all the stories I have ever had anything to do with, Tinker would insist on getting them off first, until I had to call him down, and say I would not stand for it any longer."

In introducing David Homer Bates, Mr. Plum said:

"There was a little room in the War Department office at Washington which is sometimes called the 'Holy of Holies.' Whether that is because of the rites that were performed there, or whether the title was bestowed upon it by the three or four young telegraphers who worked there, I leave to you to determine. One of the number was a young man, who within the last few months has made the military telegraph corps stronger than it had been for some time; he has injected new life into it; he has obtained sixty-five new members, and has done as he always does in whatever he undertakes—made thorough work of a good enterprise. Mr. Bates has given to the world a book, 'Lincoln in the Telegraph Office,' that will be helpful to anyone and everyone desiring a further acquaintance with that grand character of the Civil War, Abraham Lincoln, and he has furnished details and data that no subsequent historian of the country can afford to omit. It was a tremendous responsibility that was put upon these young men in that office. There came to them, day by day, night by night, hour by hour, yes, minute by minute, secrets of the armies of the United States, secrets of a million or more men. I am glad that two of these war-time telegraphers are with us to-night. First we will hear from Mr. Bates."

Mr. Bates spoke as follows: "It has given me a vast amount of pleasure to have come to this reunion. I have been able to meet members of the military telegraph corps yesterday and to-day whom I have never seen before, and others who for forty years I had not laid eyes on. You who are younger than I can imagine what a great deal that has been to me. Reference has been made by your toastmaster to the fact that I had the honor and the pleasure of knowing Abraham Lincoln, as did also my comrade for over forty years, Charles A. Tinker, also with us to-night. We saw Mr. Lincoln, as most of you already know, nearly every day during the four years of the war. Our president, Colonel W. B. Wilson, holds a commission as colonel from the state of Pennsylvania. He is a colonel for life, which is more than may be said, I think, of any other military officer, so far, at least, as I know. Colonel Wilson came to Washington the week after Richard O'Brien and I arrived, and he and I had frequent opportunities of meeting Mr. Lincoln. As Colonel Plum has said, I told some of the incidents of my meeting with Mr. Lincoln during the war, in a book which I wrote. I never supposed I would be an author. It was beyond my highest conceptions, but it did seem, after forty years or more had elapsed, that the things I and others of my corps knew, ought to be put on record, and I am very glad that I did it.

"Your next reunion has been appointed for Pittsburg, where I received my early common school education, ten years before I learned telegraphing. Andrew Carnegie, then fourteen or fifteen years of age, became a messenger boy at Third and Wood streets, in Pittsburg. Ever since that time he has been a great friend of the telegraph operators. As you know, his telegram from Washington, after Fort Sumter had been fired upon, in April, 1861, was the occasion of bringing Richard O'Brien, David Strouse, Samuel M. Brown and myself together, and a week later, William B. Wilson, all of whom were prepared to serve for the war. These gentlemen were the nucleus of the United States Military Telegraph Corps, although our friend Dealy was captured as a telegraph operator a week or two before that time. He was not, however, paid by the government, and therefore was not strictly in the military telegraph service until a few months later. Ever since that time Mr. Carnegie has taken a particular interest in the military telegraphers.

For over forty years our society has been knocking at the doors of Congress for the purpose of having an act passed which would recognize our body as an integral part of the United States Army. After thirty years had elapsed a Democratic Congress passed an act, authorizing the Secretary of War to issue to military telegraphers who had served over ninety days during the war, or to their descendants, in case of death, a certificate of honorable service. Most of us have obtained such certificates, and I need not tell you that they are highly prized. Some of you, however, who are here to-night have not yet received them. I certainly hope those who have failed to apply for this concrete evidence of their army telegraph service will not allow any further time to elapse before they do so. Possibly they may lack in sentimental regard for such a voucher, but I am sure my children and their children will place a high estimate of value on such a certificate in future years.

"A year or two ago at a dinner given in New York City, at which quite a number who are here to-night were present, Andrew Carnegie, William R. Plum, Colonel R. C. Clowry and General Thomas T. Eckert being guests of honor, we had a very remarkable meeting of military telegraphers. One outcome of that meeting was the granting by Mr. Carnegie last December of a pension of $144 per year, the same as a private soldier of the United States Army, to all needy military telegraphers. As I say, we have been asking Congress to give us recognition. The act of 1897, approved by Grover Cleveland, gave us a certificate of honorable service, but especially provided

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that no pension should follow. We still think we will get that in time, but Mr. Carnegie in the meantime has come forward and has taken the place of the government, and has granted this pension to needy military telegraphers. Sixty-five of them have already received their pension. One of them died two weeks after it came; another died within twenty-four hours. I leave it to any of you to imagine the comfort that came to those homes of the two who passed away, and the other sixty-three who are yet spared, by the receipt by them of that check for $144 from Mr. Carnegie. All of these beneficiaries have made due acknowledgement, and if I could read to you some of their letters I am sure the tears would flow from your eyes. Some of them are extremely pathetic. I made a few brief quotations from some of these letters and sent them over to Mr. Carnegie, and told him I did not believe he could know the comfort and blessing that he had given these old men and their dependent families. What do you think he wrote back? He wrote to me, 'I never realized before how much more blessed it is to give than to receive.'

"I received a letter to-day from James E. Pettit which I should have had yesterday, and I will read it to you, as follows:

"'It is with the greatest regret I am unable to meet you and the boys at Niagara Falls. My continued physical disability and the poor health of my daughter continue to produce this condition. My heart and soul are with you and all the comrades at this joyous occasion, and my hope and wishes are for a happy reunion.

"'Yours very truly, God bless you all, and kindly remember me to all my friends.'"

Mr. L. B. McFarlane, of Montreal, who was the next speaker called upon, said:

"I think the worthy toastmaster is taking another advantage. He knows I cannot make a speech and should have let me off, therefore I will say but a few words, and make way for others. Of one thing I am very glad and that is that our friends to-day took us over to Canada. But I want you to understand that what you saw across the border is not in any true sense representative of Canada. Some of you were in Montreal six years ago and there saw something—caught a view, so to speak, of something that stood exponential of Canada at that time. That city is more especially typical to-day of our great and growing Dominion, and we want you to come and see us again.

"Now, as to annexing Canada to the United States, I think we are annexing you. It is not generally known that there are as many Canadians in the United States as in Canada. We are intermarrying, and consequently are becoming better known to each other; and I think we can live, and are living, maintaining separate establishments, for both are doing wonderfully well. Canada has only just begun to really expand. We have just opened up a great north country, where there is opened up a great north country, where there is room enough for the surplus population of the United States.

"The toastmaster has referred to-night to the first meeting of the old timers. It may be of interest to some to know that twenty-eight years ago I was present in this hall at the first convention of another organization which had been formed, and that was the Telephone Association. They had their convention in 1880, and it was our pleasure at that time to send congratulations to the Old Time Telegraphers at their first meeting in Cincinnati."

Mr. Charles A. Tinker, who with Mr. Bates, also a member of the "sacred three," spoke as follows:

"I must say that the chairman has taken an undue advantage of me in two respects. He never winked to me that he was going to call upon me, and he is telling little things in public told him in the confidence of privacy. I am not given to speaking any more than Mr. Merrihew is, but I certainly think it a privilege and a pleasure to express to you all the enjoyment that I have experienced at this meeting. I feel with Mr. Bates that this coming together revives memories of old times, and that it is a satisfaction to meet thus, for our number is growing small.

"I want to speak now a little irregularly about Mr. Bates, for your chairman has mentioned some of my early connections with the United States Military Telegraph Corps. The chairman, as I say, has taken advantage of a little confidence I placed in him in telling my experiences in the War Department office on the first day. Colonel Wilson was then head of the office and manager, and Mr. Bates was operator, and I strolled in there and applied for work. I was catechised and examined by Colonel J. R. Gilmore, and finally told to go to work. He put me down at the Baltimore and Ohio railway wire, which I thought was all right, but when I found I had to do the work with pen and ink and a printed blank, where I had been doing work with soft paper and a pencil, you can imagine the embarrassment I immediately felt, and at the end of the day I was all broken up. I thought I had some patriotism and some ambition, but all such impulses had gone out of me that night. Mr. Bates and Mr. Wilson, with their kindness of heart, got around me that evening. They wanted help. And so they got me to agree to sleep over night on the proposition. I lay and thought, and wondered where and how I could get into the military telegraph, for that was what I was after. I had been hearing about the operators in Chicago who had gone to the front, one of whom had written wanting me to join McClellan; he wrote how he was getting $100 per month, and three rations per day; that it did not cost anything to live, and that he was laying up the entire $100 received. But I finally went back next morning to try if I could make it go with pen and ink; went resolutely to work and stuck to it. I was somewhat disappointed in the salary. I found that the salary there at Washington was $60 per month, while

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it cost $40 to board in a modest boarding-house across the street.

"Later I was assigned to duty in the field, finally bringing up at General McClellan's headquarters, and was one of the eight operators selected to go forward from Alexandria. These included C. W. Jaques, D. B. Lathrop, H. L. Smith, J. H. Emerick, and others, whom I don't now recall. Of the number Mr. Jaques and myself are alone living. We were to be transported by steamer, and two weeks were occupied in loading the vessel, the Commodore, and getting everything ready. I was held responsible for all supplies. I wrote a letter at this time to my father while on the trip to Fortress Monroe, detailing an account of the expedition. It was further added to and mailed home form Yorktown, Va., in 1862. It was a long communication. It was an interesting letter to me then when living in and an actor in the scenes depicted, and the oftener I read it in these latter days, the more interesting it becomes, for it is a faithful record of history.

"We had settled in front of Yorktown and every opportunity I had to write to my father, my mother or my sister, then at home in Vermont, and give them a little diary of my experience, I took advantage of. My father very fortunately saved all these letters, and I have some fifty or sixty of them now to preserve my history while in the field. Naturally I value them very highly, and will be very glad, indeed, if some of you have an opportunity to read them.

"And now I want to speak of Mr. Dealy. He was one of my companions in the War Department. He was all-night operator while I was all-night cipher clerk in an adjoining room. I took a great liking to him. He was a little fellow and I was considerably larger, and sometimes we used to get so sleepy that one would lie down and take a little nap while the other remained on watch. Mr. Dealy is a phrenologist and he insisted in making a chart of my head. I had a great many things in that head that I did not want other people to know about, but finally, in order to kill time and not have it drag too heavily, I submitted to the operation and he felt my bumps and described them, and did it well, writing out something like twenty pages in defining my character. I always valued that paper very much, and fortunately I kept it. It occurred to me, however, about ten years ago, that Mr. Dealy might have forgotten the incident. I never heard of him becoming famous as a phrenologist. It was an unkind thing for me to do, I admit, but I wrote a little note to Mr. Dealy one day. I said: 'My friend, I am very sorry to learn that you have taken the liberty of criticising, and, somewhat seriously, my character. I would like to have you explain it.' Poor fellow! I know how he felt, because we were pretty good friends, and he, of course, was stunned. He wrote me a note and wanted to know the names of the parties from whom I had received that information. Then I felt the matter was more serious perhaps than I had thought. However, I continued the deception, telling him I could not, that I had the names under confidence and could not give him the authors. Well, then he wrote me again that he must have the names. He did not come to see me, but wrote a note in reply to mine, and when he could not stand it any longer he came to see me. All the time I had this paper in my desk. I was feeling that it was more serious than I had anticipated, so I took his hand and handed him the paper, and said: "There is the evidence." If he read it over he found the evidence of criticism of my character there.

"It has been mentioned here to-night that Mr. Bates, Mr. Chandler and myself, were called the 'sacred three.' It is simply a fact that we were in a confidential position, a position that made absolutely sacred the information that we received, and so far as I know never one of us was charged with having divulged any secret of the War Department. The term was given us by Major Johnson, who was with us a great deal, and came to think a great deal of us.

"I desire, in conclusion, to speak regarding my friend Colonel Chandler, the missing member of the 'three.' I met him on the street just before leaving New York. He is bearing this week a heavy burden of sorrow. This day is the anniversary of the death of his wife, who passed away a year ago, and he came down to the city from his country home in order to get away from the associations and be by himself in Brooklyn. He wished me to say to all that he was very sorry, indeed, that he could not be with us at this particular time, and I know we all sympathize with him and recognize that he would have been here if conditions were otherwise."

The next speaker to be introduced was Mr. M. J. O'Leary, of New York, secretary of the Telegraphers' Mutual Benefit Association. He said in part:

"My connection with the telegraph business has been instrumental in placing me in charge of the Telegraphers' Mutual Benefit Association. In connection with the work which has devolved upon me through this association and through my association with kindred societies, has come to me the knowledge of one of the most potential, and, I might say, one of the most remarkable developments in the spirit of fraternity in this or any other country. The society is now in its forty-second year, and during that time it has disbursed to beneficiaries of deceased telegraphers upwards of $1,300,000, and there are no words, to my notion, that can possibly paint the good that this has done to the widows and orphans and dependent members of families of deceased telegraphers. To-day the society, very largely through the instrumentality and through the good will of the officers of the Western Union Telegraph Company, occupies an enviable and impregnable position."

Colonel Robert C. Clowry, of New York, president of the Western Union Telegraph Company, who had been a pleased listener to all that had been

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said during the evening, briefly responded when introduced by Mr. Plum. He said:

"I never had so pleasant a time in my life as I have had to-day. It has been a constant delight to meet so many of my old friends and renew acquaintances, and I hope to be present at the next meeting and to find you all well and happy, as you are to-night."

The address of Colonel William B. Wilson, of Philadelphia, president of the Society of the United States Military Telegraph Corps, concluded the speeches of the evening. His remarks were as follows:

"The patriot sentiment so closely allied to the scriptural injunction of doing unto others as you would have others do unto you, has grown year by year as the life of this Republic has progressed and brought about the peace and prosperity that is now being enjoyed by eighty million citizens. It has rung out in clear tones and, cemented by noble sacrifices, and drenched by the blood of martyrs, it came down the years from Yorktown, asserted itself at Lundy's Lane, on Lake Erie and in the Halls of the Montezumas, burned into the hearts and lives and speech of men, and enrolling itself on every page of historic progress, at last enables the white winged dove of peace and love to rest upon the sword of Grant at Appomattox and proclaim to the world that the shackles had dropped from the American bondman, and that the United States were, in fact as well as in name, a free and independent nation, with a government of the people, by the people and for the people. In the achievement of that result the sentiment animated no breasts more warmly than those of the telegraphic craft during the soul-trying years from 1861 to 1865. It caused over twelve hundred young men to leave home, family and friends, and, spurning ease and comfort, to rally 'round their country's standard, resolved to do or die, so that the nation might live, and, living, have wiped from its escutcheon the only blot that marred its harmony and beauty. The cause which these young telegraphers espoused was, in the thought and some of the words of Charles Sumner, greater than that of the fathers of the Republic, inasmuch as the latter fought for the liberty of themselves, while the Grand Army of the United States, to which the Military Telegraph Corps was attached, fought for the liberty of others, and the peerless merit of their achievement is to be found in that fact.

"In all the American citizenship there were none brighter, more intelligent, more ardently true and patriotic, and none more unselfish or self sacrificing than those followers of Morse. They were the nerves of the army and the watch dogs of the camp, and when the battle was on they were the brave couriers of the field who, undaunted and undismayed by the whistling balls or shrieking shells, carried the orders of the commander. Their sufferings and sacrifices have never been told in detail, but their invaluable services have passed into history among phenomenal performances of the young men of those days. But while history records their deeds, it is silent as to the ingratitude shown them by the government."

It was after midnight when the assembled guests arose and sang the "Ode to Morse," words and music of which were written by Marion H. Kerner, a member of the Military Telegraph Corps.

Among those present were:

Ashtabula, O.—C. W. Jaques.

Bangor, Me.—P. J. Feeney and wife.

Boston, Mass.—J. B. Colson and wife.

Buffalo, N. Y.—Joseph Anderson and wife; G. A. Burnett and wife; N. Hucker and daughter; T. A. Laird, John Lapey and wife; J. G. McNerny, L. M. More and wife; G. C. Newman, J. A. Pferd, H. D. Reynolds, wife and daughter; W. A. Sawyer, and J. W. Sullivan.

Chambersburg, Pa.—Col. J. R. Gilmore.

Chicago, Ill.—A. H. Bliss, C. Exera Brown, J. R. Dixon, S. E. Ingram, and L. W. Marston.

Cincinnati, O.—C. E. Sawtelle and wife.

Cleveland, O.—Geo. W. Baxter, Mrs. C. A. Jury, G. T. Williams, and Grace J. Williams.

Columbus, O.—C. W. Black and wife, and O. H. Newell.

Dallas, Tex.—F. B. Knight.

Denver, Colo.—H. T. Schroder and wife.

Detroit, Mich.—John L. Currier and wife; F. J. Dayman, wife and daughter; James Moxam and wife; J. L. H. Peterson, and R. M. Ross and wife.

De Witt, Mich.—J. E. Jayne.

Duquesne, Pa.—Miss M. D. Shryock.

Elmira, N. Y.—W. N. Estabrook and wife.

Erie, Pa.—Geo. J. Goalding.

Holmesburg, Pa.—Col. Wm. B. Wilson.

Indianapolis, Ind.—D. S. Bacon.

Jersey City, N. J.—J. B. Bertholf.

Johnstown, Pa.—Mrs. Peter Weitz and two daughters.

Lombard, Ill.—W. R. Plum.

Mattawamkeag, Me.—F. A. Perley.

Montreal, Que.—W. J. Camp and wife; L. S. Humes and wife, and L. B. McFarlane and wife.

Mount Clemens, Mich.—J. Schanher and wife.

Muskogee, Okla.—J. R. Brown.

Niagara Falls, N. Y.—M. J. Donohue and F. S. Lewis and wife; W. J. Martan and wife.

Newark, O.—C. A. Anderson.

New Hartford, N. Y.—F. C. Mason.

Newport, Ky.—R. D. E. Rowe and wife, and Miss M. Werden.

New York.—D. H. Bates, Belvidere Brooks, W. C. Burton, Col. R. C. Clowry; W. J. Dealy, L. Dresdner and wife; Mrs. Marguerite C. Gates, J. J. Ghegan, E. P. Griffith, W. L. Ives, M. J. Kenna, M. H. Kerner, F. E. McKiernan, D. F. Mallen, James Merrihew, E. M. Mulford, M. J. O'Leary, Fred Pearce, F. J. Scherrer, J. B. Taltavall and wife; C. R. Tilghman, C. A. Tinker and J. B. Van Every.

Norfolk, Va.—L. C. Hall, wife and daughter.

North East, Pa.—Mrs. W. L. Stow.

Oil City, Pa.—W. F. Miller and wife.

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Onosso, Mich.—J. M. Beckwith and wife.
Philadelphia, Pa.—J. E. Janney, wife and daughter, and John Wintrup and wife.
Pittsburg, Pa.—William Albaugh, wife and daughter; G. M. Ferry, wife and daughter; D. Kelly and wife; F. J. McKenna, Mrs. W. J. McQuaran, T. E. Moreland and daughter; W. R. Smith, wife and daughter; J. B. Stewart and wife, and J. W. Yealy, wife and daughter.
Rochester, N. Y.—H. L. Gregg and J. K. Parsons and wife.
Springdale, Pa.—Mrs. Lizzie C. Adams.
Springfield, Ill.—H. H. Matlock.
St. Johns, N. B.—P. W. Snider and wife.
St. Louis, Mo.—R. H. Bohle and wife, and J. P. McClure and wife.
Tip Top, Ky.—G. M. Dugan and wife.
Toledo, O.—W. G. Brownson.
Toronto, Ont.—I. McMichael and wife.
Vincennes, Ind.—J. C. Watts.
Washington, D. C.—J. H. Robinson and wife, and James D. Tyler.
Waterville, Pa.—H. W. Hedge.
Yonkers, N. Y.—J. A. Townsend.

An Operator's Zeal.

"The first office that I found myself in possession of," said the retired telegraph operator, "was a little way-station where there was not much else to do but to report the trains. I had the night trick, and the trains being few and far between, I spent most of my time dreaming of advancement. One night, soon after I had taken this office, I was called to the key to receive a message that came over the wire addressed to a railroad official who chanced to be visiting some relatives who lived about three miles from the office where I was.

"'Violet is dying,' the message read, and those three words sent the shivers up and down my back as I saw, with my imagination, a fair-haired, blue-eyed little girl dying, with her father far away from home. Then it suddenly flashed upon me that here was a chance to win promotion by hurrying the message out where the father was. I was alone in the office, and there was no one living near by whom I could send it.

"At last I determined to take it myself. I knew I had no business to leave the office, but I considered it a chance to win recognition that I might never have again. It was before the time of the bicycle, and, as there was no horse to be had, I started out afoot. There was a train leaving about 1 o'clock in the morning, and I had figured it out that the anxious father would take that train for the city, and that I would be able to get a ride back to the station with him, and have, at the same time, a chance to create a good impression.

"It was in the fall of the year and raining as hard as it could pour, with prospects that it would turn to snow before I got back. I was a little bit hazy just where the party was staying, but after braving any number of dogs and arousing any number of farmers, I found the right place and delivered the message. The man, with a white face, hastily tore the envelope and read the contents, while I waited for him to say, "Well done, thou good and faithful servant!

"But he didn't. He said things that I would not care to repeat, and called me any number of names that were not the least bit complimentary. It made me mad to see such an exhibition of unconcern over such a serious matter, and I was about to say so when he broke in with another torrent of strong words, of which I caught, 'fool woman,' 'pug dog,' 'glad of it.'

"Then I comprehended, and as I tramped wearily back to the office I had deserted, I had plenty of time to take a solemn vow never to again bother my head about what might come over the wire."—New York Sun.

Book Review.

"Lord Kelvin," an account of his scientific life and work, a volume just off the press, by Andrew Gray, professor of natural history in the University of Glasgow, Scotland, a former pupil of and assistant to Lord Kelvin, presents a point of view of that noted scientist, concentrated within the limits stated, of a nature such as to render it valuable to the many who were accustomed to look up to Lord Kelvin as a great leader in the world of science. The activities of Lord Kelvin, even up to the time immediately prior to his death, which occurred on December 16, 1907, were prodigeous, and the unfolding and development of his life and character along the lines of scientific thought, study and experiment, leading to discovery unceasingly pursued; the reaching of profound attainments in electrical and other research, including the telegraph, more especially in its application expressed in submarine working, in which connection he invented the mirror galvanometer and the siphon recorder—all may be traced in this delightful volume with pleasure and profit. This book, which is well printed on good paper, contains 316 pages, several illustrations, a number of explanatory drawings, and is fully indexed. It will be sent to any address, carrying charges prepaid, on receipt of price, $1.25, by J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

The British delegates appointed by the London Board of Trade to attend the International Conference on Electrical Units and Standards, which is to meet in London on October 12, are the Right Hon. Lord Rayleigh, O.M., P.R.S.; Prof. J. J. Thomson, F.R.S.; Dr. R. T. Glazebrook, F. R. S.; Sir John Gavey, Kt., C. B.; W. A. J. O'Meara, R. E., C. M. G., and Mr. A. P. Trotter. Mr. W. Duddell, F.R.S., and Mr. M. J. Collins, of the Board of Trade, will act as secretaries to the British delegates, and Mr. F. E. Smith and Mr. C. W. S. Crawley as assistant secretaries.

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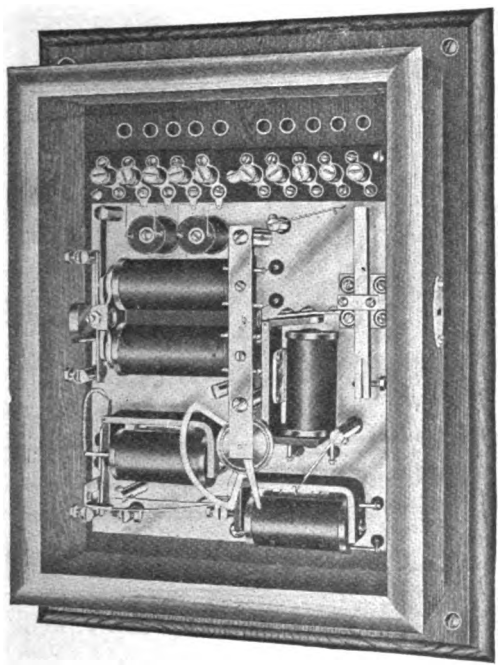

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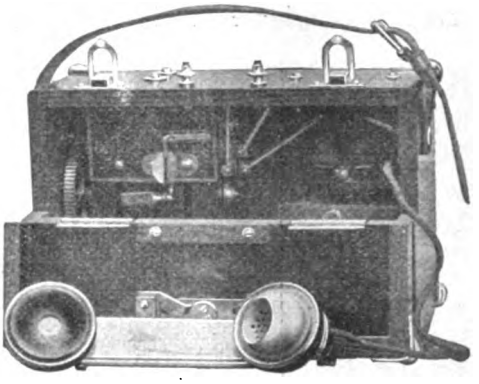

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The Railroad.

The regular September meeting of the Railway Signal Association was held at the Great Northern Hotel, Chicago, on September 8. About fifty members were present. Mr. L. R. Clausen presided.

Mr. Frank Camp, son of William J. Camp, electrical engineer of the Canadian Pacific Railway Company's Telegraph, Montreal, Que., has been placed in charge of the telephone service of the system in British Columbia.

The Interstate Commerce Commission has made an informal ruling that railroad telegraphers may, under the federal law regulating hours of service of railroad employes, work in excess of nine or thirteen hours in cases of emergency where trainmen may work more than sixteen hours.

Presiding Judge Coffin, of the Jackson Circuit Court, Alabama, has declared unconstitutional the act passed by the last legislature of that state, providing an eight-hour day for railroad telegraph operators, on the ground that it interfered with interstate commerce and the subject was covered by an act of Congress.

It is expected that train despatching by telephone will be an accomplished fact October 1 on the division of the Chicago, Rock Island and Pacific Railway between Chicago and Rock Island. The work of installation was carried out under the direction of J. G. Jennings, of Chicago, superintendent of telegraph of the road. The telephone will displace the telegraph only in the despatching of trains. The telegraph will be continued in use for all other business of the road. There will be no laying off of operators by reason of the new system.

At the quarterly meeting of the western division of the American Association of Railway Telegraph Superintendents, held in Chicago, September 17, eighteen roads were represented, as follows; Chicago, Milwaukee and St. Paul; Chicago, Burlington and Quincy; Chicago, Rock Island and Pacific; Chicago and Northwestern; Atchison, Topeka and Santa Fe; Missouri Pacific; Union Pacific; Grand Trunk; Queen and Crescent; Great Northern; Wabash; Michigan Central; Pennsylvania Lines West; Chicago, Indiana and Southern; Baltimore and Ohio; Chicago and Eastern Illinois; Wisconsin Central, and Illinois Southern. The western division includes all roads north and west of the Ohio River. Various subjects relating to service and construction matters, telegraphic and electrical, were discussed and acted upon, the one of greatest interest, says the Railroad Age Gazette, being the use of the telephone for the despatching and blocking of trains. Reports to the meeting indicated that within the last two years over 6,000 miles of road have been placed under telephone operation. Nearly all of this mileage is on heavy divisions, both single and double track. The advantages as to safety and efficiency from its use were brought out and reports indicated that on divisions so managed train movements were being greatly expedited by the greater speed and flexibility of the telephone working. The train despatcher's duties are lightened, giving him more time to figure out and plan his movements, all of which tends to facilitate train movement and promote safety; operators' duties are likewise lightened. It was the unanimous judgment of the members present, many of whom are in general charge of train despatching by telephone, that the use of the telephone for the despatching and blocking of trains has demonstrated its safety and superiority for such purposes. The following resolution was unanimously adopted:

Resolved, That in the judgment of this association the use of the telephone in the despatching and blocking of trains is just as safe, if not safer, than the telegraph, and in addition thereto has many advantages; therefore, we unanimously endorse its use and recommend its further adoption for such purposes.

Methods for Locating Transpositions of Wires and Split Pairs in Telephone and Telegraph Cables.

Henry W. Fisher, in a paper published recently, stated that:

"Some of the telegraph companies demand that there shall be no transposition of wires in any of the layers in a telegraph cable. By this is meant that the wires of every layer must have the same relative order at each end of the cable. There is usually a tracer or wire covered with different colored paper from the rest in every layer, and by counting from this tracer any particular wire can be located at any point in the cable. If a wire is fifth from the tracer in a clockwise direction at one end of the cable, it will be fifth from the tracer in a counter clockwise direction at the other end of the cable. By this general plan it becomes possible to identify wires without resorting to some of the common methods of testing. However, in order to be able to place implicit reliance in a scheme of identification of this sort, not only must the cables be manufactured correctly, but the jointing must be made by skilled men who are careful to connect the wires of each layer in consecutive order, and as an extra precaution make repeated tests at both ends of the jointed sections as the work of splicing progresses. Even after exercising the greatest care, a transposition may occur."

Among the exhibits that will be made at the New York Electrical Show, to be held at the Madison Square Garden, October 3-14, in the section commemorative of the Atlantic cable of 1858, the Commercial Cable Company, through President Mackay and Vice-president Ward, is making a loan exhibit of relics, appliances, maps, models, etc., covering the entire period of submarine cable development, the whole constituting an object lesson of much interest.

"Pocket Edition of Diagrams," etc., the latest revised edition, 334 pages and 160 illustrations, published by TELEGRAPH AGE, contains just the information every telegrapher needs.

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The Atlantic Telegraph Company.

A successful independent telegraph company maintained in this country is that of the Atlantic Telegraph Company, a New England enterprise. It has had a prosperous career during the year and a half it has been "going alone," and especially so since the management has been placed under the direction of Robert Morton, formerly of New York, well known in telegraph circles. One of our Portland, Me., correspondents writing of this company, says:

"It may be interesting to some of your readers to know that the Atlantic lines were constructed from Boston to Portland, Maine, by John Donovan, of Lowell, Mass., in 1885. Two years later they were leased to the Baltimore and Ohio Telegraph Company, for a term of twenty years. As the Baltimore and Ohio company was absorbed by the Western Union Telegraph Company, the Atlantic lines came under the jurisdiction of the latter, by which they were operated up to the expiration of the contract, which was on February 1, 1907. The Western Union and the Atlantic companies failing to agree upon terms for a release, the Atlantic company took over its property, and on August 15, 1907, placed it under the general management of Mr. Morton. Its lines have been carefully gone over and put in prime condition; the Edison current has just been put into service on them at the Boston end, and a part of the machinery to introduce it at the Portland terminal has been received.

"The Portland office of the company has recently been thoroughly overhauled and new operating tables placed therein. George L. Gaskell, formerly chief operator for the New England Telephone and Telegraph Company, at that point, is now superintendent of the Atlantic lines, with headquarters at 28 Exchange street, James H. Price being manager of the office. At Biddeford, Maine, Frank L. Malone, formerly The Associated Press operator at the Standard office, is the manager. The office at Dover, N. H., is under the direct charge of Fred C. Stuart, and, strange to say, occupies the same room at 3 Waldron street, in which it was originally located twenty-three years ago, even the same quartette operating table being used.

"At Portsmouth, N. H., T. C. Lecky, who has been identified with the telegraph in that town for forty years, is the manager. Mr. Lecky, has had about all the telegraph experience that Portsmouth has had to spare. He was at one time manager of the Western Union interests, next those of the Baltimore and Ohio, then the Postal, and now the Atlantic. Mr. Lecky is also engaged successfully in other outside business. George B. Shaw is the manager of the office at Exeter, N. H. He was formerly quite extensively engaged in the construction of opposition telephone exchanges, and possesses a wide acquaintance. The Lawrence, Mass., office is managed by George B. Cooney. At Lowell, Mass., the office is under the management of Miss B. M. Sutcliffe, and does a fairly good business; yet the fact that it is distant only twenty miles from the Hub, the telephone does most of the business that the Atlantic lines would otherwise handle.

"The headquarters of the company were moved to Boston from Lowell on August 1 of this year, and are located at 61 Hanover street, the operating department occupying rooms 23 and 24, and the general manager room 20A, at that address. George F. Pleadwell is the city manager at Boston, and M. E. Cookson chief operator.

"The business of the compay is steadily growing, and the Atlantic company has excellent prospects."

Since the above was put in type the control of the Atlantic Telegraph Company has passed by purchase into the possession of the Telepost Company, of New York, of which H. Lee Sellers is president, and which proposes to accept business at the uniform rate of twenty-five cents for twenty-five words, and five cents for each additional ten words.

Comparative Speeds of Morse Signals Required for Sending and Punching.

The following article from The Telegraph Chronicle, of London, will be of very general interest to telegraph operators:

The Morse telegraph alphabet of twenty-six English letters contains eighty-two signals or 3.1538 average signals per letter and 15.769 average signals per word of five letters. The basis of the alphabet is the dot. A dash is equal to three dots. The space between the signals of a letter is equal to one dot, representing the letter e. The space between the letters of a word is equal to three dots. The space between two words is equal to six dots.

The following table shows the comparative approximate number of signals required for sending or punching twenty to forty words of five letters each per minute or second:

Sending			* Punching		
No. words per minute.	Signals per minute.	Signals per second.	Signals per minute.	Signals per second.	No. words per minute.
20	315.38	5.26	435.38	7.26	20
21	331.15	5.52	457.15	7.62	21
22	346.91	5.78	478.91	7.98	22
23	362.68	6.04	500.68	8.34	23
24	378.46	6.31	522.45	8.71	24
25	394.22	6.57	544.22	9.07	25
26	409.99	6.83	565.99	9.43	26
27	423.76	7.06	587.76	9.79	27
28	441.53	7.36	609.53	10.16	28
29	457.30	7.62	631.30	10:52	29
30	473.07	7.88	653.07	10.88	30
31	488.84	8.15	674.84	11.24	31
32	504.61	8.41	696.60	11.61	32
33	520.38	8.67	718.37	11.97	33
34	536.15	8.93	740.14	12.34	34
35	551.91	9.19	761.91	12.69	35
36	567.68	9.46	783.68	13.06	36
37	583.45	9.72	805.45	13.42	37
38	599.22	9.99	827.22	13.79	38
39	614.99	10.25	848.99	14.15	39
40	630.76	10.51	870.76	14.51	40

* Including spacing signals.

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Radio-Telegraphy.

According to present arrangements the new wireless station at Varna will have a range of action of three hundred and eighty-five miles. The Bulgarian government is in negotiation with the Marconi Company regarding the operation of the station.

Direct communication has been opened between the Norddeicher Telefunken station and the central telegraph office in Berlin, and it is now possible to transmit telegrams to the Berlin Telefunken station, whence they are transmitted to the ships.

A new wireless telegraph plant has been installed at the Kahuku station of the Hawaiian group. A message was picked up recently from the American battleship West Virginia, of the approaching fleet, while the ships were still 1,000 miles at sea.

Wireless telegraphy is now being used in connection with the German sea-fishing industry. The flagship of the fishing fleet has been fitted with wireless equipment, and messages can be sent from this ship to the German mainland. Special rules have been laid down for the conduct of this traffic.

The Australian government proposes to erect five "wireless" stations at Cape York, Thursday Island, Goode Island, Port Moresby and at Freeman's Island. The two stations of Cape York and Port Moresby will have a range of at least three hundred and fifty nautical miles, while the Freeman's station will work to three hundred miles.

A patent, No. 898,197, for a wireless telegraph apparatus, has been granted to Halsey Dunwoody, of the United States Army. A portable wireless apparatus adapted to send and receive messages for distances of over one hundred miles, and which is portable, includes complete features of transmitter and aerial.

A patent, No. 897,275, for wireless telegraphy, has been awarded to Reginald A. Fessenden, of Washington, D. C. In signaling apparatus an inductive coupling, and a receiver placed in the secondary of the coupling, and within influence of the primary so that the primary acts to shield it from disturbing influences.

A patent, No. 897,779, for a receiver for wireless signaling, has been issued to Valdemar Poulsen, of Copenhagen, Denmark. The method of wireless signaling which consists in impelling the energy from a resonant oscillation circuit having inductance and capacity through a detector having inductance by periodically unbalancing or destroying the condition of resonance in said circuit.

Lieutenant-Commander Clelland Davis, in charge of wireless telegraph work in the Navy Department, has submitted to the Secretary of the Navy plans for a wireless station on the top of the Washington Monument, by means of which it is claimed communication may be established with warships at any point within a distance of 3,000 miles.

Mr. Marconi, who recently arrived in New York, declares his object to be to complete and perfect the service between Canada and the other side. He said: "We have experienced great difficulty with the land lines from Canada, and want to get a big station nearer to New York. What we intend to do is to perfect the station at Cape Cod for receiving transatlantic messages there." Mr. Marconi said that the Cape Cod work probably will be completed by Christmas. Then his attention will be given to wireless work on the Pacific side of the continent.

The Southern Wireless Telegraph Company has been incorporated at Little Rock, Ark., with a capital of $1,000,000, of which $25,000 worth of stock has been subscribed for. George A. Parker is president; Harry C. Hale, secretary, and R. T. Balch, treasurer. This concern, it is stated, intends to erect a station for wireless telegraphy on top of the Southern Trust Building, Little Rock, and to establish connection with eighteen other stations in Arkansas, Louisiana, Mississippi and Oklahoma. The locations of these stations have not yet been determined.

Dr. Lee De Forest has made arrangements with the French government to use the Eiffel Tower for the purpose of establishing telephone communication between Paris and New York, the American antenna being erected on the Metropolitan Life Insurance Company's tower, which is 680 feet high. He believes that his apparatus will have a radius of communication of 1,000 miles, and he hopes that improvements now in progress will increase this sufficiently to make possible transatlantic communication. The great height of the antenna will enable him to use waves so long that to ordinary apparatus they will be inaudible.

It is stated that Valdemar Poulsen, the Danish engineer, has just carried out a series of interesting experiments in the direction of high-speed wireless telegraphy with new apparatus devised by him. The fast system is intended for use over the ocean, and the new Poulsen apparatus, corresponding to the Wheatstone apparatus, is said to fully attain the capacity of the latter. The provisional experiments, which were conducted between the stations at Lyngby, near Copenhagen, and Esbjerg, on the west coast of Jutland, are declared to have resulted in the transmission of about one hundred words per minute, and the inventor calculates that he will soon succeed in telegraphing one hundred and fifty words a minute. It is added that the trials will, in the immediate future, be continued between Lyngby and Tynemouth, and new stations are being erected on the west coast of Ireland and in Canada, between which the high-speed system is to be employed.

The important part which wireless telegraphy plays in navigation during fog will be seen from the following incident related by the captain of the North German Lloyd liner "Kaiser Wilhelm II." He says that during a recent voyage from

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New York he encountered fog at the entrance to the English Channel. Neither Scilly nor Wolf Rock could be sighted and no fog signals could be heard. As he could not hear the fog signal on the Lizard, at 1.32 communication with the Marconi station at the Lizard, was effected, and, he discovered that this station could hear the liner's steam whistle two or three miles away. The course was now set for Eddystone, and the agent at Plymouth was instructed (by "wireless" presumably) to send the tender out. At 3.15 Eddystone's fog signal was heard, at 4.40 answer was received from the tender and the liner anchored; ten minutes later the tender came alongside, and having landed passengers, mails, luggage and cargo, the liner's journey was continued at 5.35 without Plymouth having been sighted.

Four more radio-telegraph stations will be established in British Columbia before the end of the present year, and the Dominion Government is now considering the sites upon which to erect these stations. The success of the stations at Cape Lazo, Point Grey, Pachena, Estevan and Victoria, which have been in operation for the past six months, has induced the government to proceed with the execution of the original plan of erecting ten stations, and the additional four are to be ready for operation before the end of the year. These will include one at Prince Rupert, the Pacific Coast terminus of the Grand Trunk Pacific; one at the northern end of Vancouver Island, and one on Moresby Island in the Queen Charlotte group. An example to the other transpacific lines has been set by the "N. Y. K." line of Tokio, which has equipped its six steamships of the American fleet with wireless. At present these liners communicate direct with Victoria when two hundred miles out at sea. The Pacific Coast Steamship Company's fleet were among the first of the coastwise fleets to be equipped with wireless, and now about ten of the steamers plying between Seattle and Alaska are provided with facilities. The Canadian Pacific Railroad Company is at present considering a proposition from the United Wireless Company to equip all its vessels, and orders have just been given by the Inland Navigation Company for installations on all the vessels of its fleet. In addition to the big liners a number of smaller coasting steamers have been equipped and in every way the system is proving most popular.

Propagation of Electric Waves in Wireless Telegraphy.

James E. Ives, Ph. D., in an article in the Electrical World, attempts to give a physical explanation of the throwing off of electrical energy into space by a wireless telegraph antenna. He says:

"The mathematical equations for electric waves, which were first given by Maxwell in 1864, indicate the possibility of a rhythmical propagation of electrical energy through space without the aid of wires. These equations, however, can hardly be said to describe, or explain, the method of mechanism of such propagation.

"Hertz in 1888 showed experimentally that such electric waves actually exist, and that they behave in the same way as waves of light, moving in straight lines, being reflected, refracted and under proper conditions, interfering with one another.

"In 1895 Marconi showed that long electric waves, carrying much energy, could be used for telegraphic purposes, and since his first experiments an army of investigators and experimenters have used these waves continuously for the purpose of long-distance communication. The result is that the earth is now dotted with wireless telegraph stations sending out and receiving these waves, day and night.

"The belief in the existence of electric waves is now as strong and real as the belief in the waves of light, or even in the waves of the ocean. In the mind's eye, when a wireless telegraph station is in operation, there are seen ripples, in the all pervading medium, the ether, issuing from the antenna and spreading out in ever enlarging circles, just as the ripples arise and spread on the surface of a pond from the point where a stone has fallen into it. These electrical ripples in the ocean of the ether are the electric waves which carry messages even across the oceans.

"Although this analogy of the water ripple gives an excellent idea of the sort of thing which is taking place around an antenna, when in action, and is therefore perfectly justified in its use, it does not explain in detail how these pulses of energy become detached from the antenna, nor does it explain how when once started they proceed to move outward."

Telegram Went Too Fast.

Like a typographical error for which a newspaper receives censure, the uniform good work performed being accepted as a matter of course, people often complain of delayed telegrams, but there are few public records made of quick delivery. It appears that a gentleman in Richmond, Va., sent a telegram of thirty-five words to Washington a few days since over the Western Union lines, and fifteen minutes later had urgent reason for desiring its non-delivery. Manager Stevenson, of the Richmond office, did all in his power to recall the message immediately, but without avail. The record of the Washington office shows that the message was delivered to the addressee in Washington sixteen minutes after it was filed by the sender.

Every telegrapher who loves his profession, who is determined to master its technicalities, and thus insure for himself the confidence and respect of his official superiors and place himself in the direct line of promotion, should subscribe for and become a careful reader of Telegraph Age.

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Venezuela and the French Cable Company.

Writing from Caracas under recent date, a New York correspondent in referring to the troubles between Venezuela and France, had this to say respecting the relations existing between the former and the French Cable Company:

"The judgment against the French Cable Company of about $5,000,000 is an exact duplicate of that rendered last year against the New York and Bermudez Company for the alleged support of the Matos revolution. The fines levied are not only for the identically same amounts, but they are identically the same damages, that is, the cost to the Venezuelan government of putting down the revolution and the falling off in customs receipts and general loss of revenue due to the revolutionary disturbance. The lawyer appointed by the government to defend the suit of the cable company, after the imprisonment several months ago of the company's lawyer, entered objection against the same damages being collected from the cable company as from the Asphalt company, and for the same offense. The court ruled, however, that this was legal, as the New York and Bermudez Company had not yet paid the $5,000,000 fine.

"President Castro probably has small expectations of getting any cash from the French cable company, but he is believed to have a very determined idea to get the coast cables in part payment for this fine and as chastisement for the complicity in the revolution. These cables connect all of the principal seaports of the country and cost almost $1,000,000 to lay. They would be of great strategic importance to the national government, especially in case of revolution. As soon as a revolution break out in Venezuela, telegraphic communication is constantly interrupted because it is such an easy thing for the revolutionists and their sympathizers to keep the wires cut. With the coast cables Castro could always maintain uninterrupted communication with all the large ports.

"The reason that Venezuela has been absolutely cut off from the world for so many years now is that President Castro has insisted, as a basis of settlement with the French Cable Company, that these cables be ceded to the Venezuelan government as indemnity for the participation in the revolution. The company, of course, has always refused. But President Castro will soon get these cable lines by legal process unless the French government at last takes some stand in support of the company."

The British Pacific Cable.

The annual report to March 31, 1908, of the Pacific Cable Board, dated July 22, is but lately issued. After deploring the loss of Sir Spencer Walpole, the late chairman of the board, and of Mr. C. H. Reynolds, the late manager, the reports set out the financial results of the preceding year's operations.

The traffic receipts amounted to £113,548 18s. 1d., less £3,911 13s. paid to the Atlantic companies for handling the board's messages. Interest on deposits realized £522 17s. 3d., leaving the deficiency (£62,362 10s.) recoverable in the following proportions: United Kingdom, £17,322 18s. 4d.; Canada, £17,322 18s. 4d.; Australia, £20,787 10s.; New Zealand, £6,929 3s. 4d. Total receipts, £172,522 12s. 4d. Expenditure included head office (salaries and expenses) £4,345 9s. 1d., ditto (advertising, canvassing, engineers' fees, royalties, and cost of remitting money home) £1,596 12s. 7d., stations (salaries and expenses) £38,764 16s. 1d., ship (salaries and expenses) £16,759 12s. 11d., provident funds £1,511 3s. 8d., renewal account £32,000.

Compared with 1906-07, there was a falling off of £2,852 15s. 2d. in gross traffic receipts; but of this the greater part (£1,800 to £2,000) is only apparent, the accounts for 1906-7 having included the receipts at Southport for thirteen months, while those for 1907-8 include only twelve months' takings. On the expenditure side there has been an increase of £4,082 13s., £2,027 16s. due to the insurance on the board's cable ship; but nearly one-half of the premium will probably be eventually recovered. The remainder of the increase is attributed to various causes. Expenditure on the maintenance and working of the cable during the year, including £32,000 carried to renewal account and £1,511 3s. 8d. contributed to the provident fund, amounted to £94,977 14s. 4d., or £15,182 8s. less than the net revenue earned. The annuity to the National Debt Commissioners absorbs this surplus, and £62,362 10s. in addition, which has to be made good by the several governments associated in the enterprise. The total contributions to the renewal fund, including interest, amounted on the 31st of March last to £198,836 12s. 11d., £12,500 of this sum being held in spare cable.

The board's forecast of its probable revenue and expenditure during the year 1908-9 is as follows:

Traffic revenue	£108,000
Estimated deficit	69,566
	£177,566
Sixth annuity	£77,545
Renewal fund	31,000
Working expenses	69,021
	£177,566

The land line services in Australia and New Zealand have been generally well maintained by the governments concerned. The Atlantic companies have afforded uninterrupted cable communication throughout the year, and a rapid and efficient service. In Canada the lines of the Canadian Pacific Railway, both in Vancouver Island and elsewhere, suffered considerable interruption, first from bush fires and unusual electrical disturbances in July, August and September, and later from severe storms in November and December. In the latter month, a gale occurred in

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Vancouver Island which is said to have been the worst on record in that region, and caused an interruption of over seventy hours, all the wires having been thrown down. In August, moreover, the traffic, more especially that to the states, was considerably disorganized by reason of the strike of telegraph operators in Chicago, and the sympathy it excited among those employed by the Canadian Pacific Railway.

The health of the staff has been satisfactory throughout the year, and the service rendered by them has continued to be maintained on the high level of efficiency and zeal which has characterized it in previous years. Throughout the year the cable has worked without interruption, and no repairs have been called for. The buildings, electrical apparatus, and plant, at all stations, have been maintained in good order. No damage has occurred to the repairing vessel "Iris," and the discipline and efficiency of the ship's company have continued to be thoroughly satisfactory. The wharf and shed, which the New Zealand government undertook to provide for her use at Auckland, were completed by January of this year, and permanent moorings for the vessel are now in course of being supplied.

LETTERS FROM OUR AGENTS.

PITTSBURG, WESTERN UNION.

William H. Maize, quadruplex and repeater chief, was married recently to Mrs. Anna Canan, formerly from Tyrone, Pa.

Miss Cora Reese went recently to Braddock to relieve the manager, Miss E. C. Henkel, at that point while she was on a vacation.

Miss Pearl Creel was likewise sent to Punxsutawney, Pa., to relieve Miss M. A. Campbell, manager, to enable the latter to absent herself on a vacation trip.

D. Kelly, chief of the Barclay repeaters, accompanied by his wife, spent his vacation in Buffalo attending the reunion of the old time and military telegraphers and at Niagara Falls; subsequently visiting Toronto and other points in Canada.

Theodore E. Moreland, one of Pittsburg's military telegraphers, who has charge of the repeaters at night, was another visitor in attendance at the meeting of the United States Military Telegraph Corps at Niagara Falls, passing the remainder of his vacation at New York, Washington, Fredricksburg and visiting familiar scenes of the old battlefields where he has served.

Others who have been on vacation are: W. J. Dodge, chief operator; A. L. Dagens, who went to Detroit; David Lewis, loop chief, who went south; William Schrogen, who spent his time at Atlantic City; John Forhan, who visited at Wellsville, his native place; M. L. Fogle, repeater chief, who brought a bride back with him, and Miss Gertrude Sherriff, who left her key on the Pittsburg-Washington duplex to enjoy a well-earned rest; I. N. Barto, general wire and repeater chief; R. Sterling, repeater chief; Miss Gertrude Fitzgerald, H. J. Cupp, Miss E. P. O'Neill, and P. J. McKeever.

H. M. Burrell, wife chief, is recovering from a serious attack of pneumonia.

Continued ill health has compelled Ed. Farnett to resign his position to seek a more favorable climate.

TOLEDO, O., WESTERN UNION.

The large amount of special matter which was filed during the late G. A. R. encampment, and by reason of the presence of W. H. Taft, Republican candidate for President, in the city, was creditably taken care of by the force.

Traffic Chief, W. G. Davis, who has been on the sick list for the past two months, is slowly improving. The traffic is being taken care of by Operator C. Van Kueren.

RALEIGH, N. C., WESTERN UNION.

Business at this office is good, having shown a substantial improvement since the first of the year, in fact necessitating an increase of the operating force, L. J. Dughi being added about two months ago.

E. R. Riddle, who is spending a four months' vacation at Mars Hill, this state, is being relieved by W. M. McRary.

CHICAGO, WESTERN UNION.

J. E. Dayhoff, night chief operator, has resigned on account of ill health, and will go to Pasadena, Cal., where he hopes to derive benefit by the change in climate.

H. T. Price is acting night chief operator and George C. Gute, assistant.

J. F Hickey, who has been assisting H. Detcher in the New York division, has been transferred to the quadruplex room; W. E. Claibeau, assistant to F. H. Gournoe, in the overland, has been transferred to the New York division; D. S. Gittings is assisting in the overland at night, and H. Brown assisting J. L. Pierce in the day time.

Mrs. Rose Dillon died August 29, after a lingering illness. The burial was at Pittsburg.

A. B. Cowan, chief operator, accompanied by his wife, is on a fishing trip in northern Wisconsin.

Mr. Boydston, an old employe of this office, is seriously ill.

M. M. Lovelace and wife have resigned and accepted positions at Seattle, Wash.

James Shaughnessy has resigned to accept a position in the Barclay department at Denver.

NEW YORK, WESTERN UNION.

Mrs. W. E. Eichler, who has been acting manager of the Middletown, Conn., office, has returned to her duties here.

Edward Messler has returned from State Camp at Sea Girt, N. J., where he was on duty during the international shoot.

W. L. Ives, vice-president of the United States Military Telegraph Corps, who attended the annual reunion of the "old timers" at Niagara Falls, spent a short vacation at Syracuse.

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The following operators were detailed to the Democratic state convention, in charge of R. J. Murphy: R. M. Christian, J. A. Donahue, T. Nolan, T. T. Parr and Mr. Wilcoxen.

Those detailed to the Republican state convention at Saratoga under charge of Mr. Harry Pearce, were: Messrs. Bellis, Collins, Erwin, Wendroth, Jannace, Walsh, Gregovorius and Leopold.

Chief operator T. A. McCammon, himself an ardent disciple of the late Izaak Walton, was the recipient of an eleven-pound bass, caught by C. A. Kilfoyle, secretary of the Telegraphers' Aid Society, while on his vacation recently.

D. W. McAneeny, eastern wire chief, whose health of late has not been of the best, has gone for a three weeks' vacation to Canada.

George F. Stainton, western division chief, is absent on vacation.

William Mayer, of this department, and a justice of the peace in Wallington, N. J., has been nominated for freeholder in that town.

R. T. Herlihy has returned to Boston to resume his studies at the Massachusetts Normal Art School.

The entertainment committee for the annual reception and entertainment of the Telegraphers' Aid Society, are working very hard in their efforts to make the affair, to be held on November 10, at the Lexington Avenue Opera House, a grand success.

A. L. Bougher, for many years an operator in this office, but for the past year and a half agent of the Long Island Railroad at Amagansett, L. I., is in the hospital at Long Island City, suffering from a fractured knee.

OTHER NEW YORK NEWS.

Assessment No. 483 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of John Brant, at Brooklyn, N. Y.; Nicholas C. Pamplin, at Pamplin City, Va.; George H. Albee, at Windsor, Conn., and James H. O'Donnell, at Philadelphia.

The Magnetic Club of New York, announces that its fall dinner will take place on Wednesday evening, November 18, at the Hotel St. Denis. This will celebrate the twentieth anniversary of the club. The delegates to the annual meeting of the Telegraphers' Mutual Benefit Association, to be held at that time, have been invited to attend as guests of the club.

Mr. E. F. Howell, secretary of the Serial Building Loan and Savings Institution, who has been visiting his old home in Canada, has returned to his office much improved by the rest.

Mr. Joseph Orton Kerbey, of Washington, the old-time telegrapher, who went to Rio Janeiro, Brazil, in June last, as a representative of the Pan-American Bureau, to attend the meeting of the International Bureau of American Republics at the opening of the Brazilian Exposition, reached New York on his return on September 25. While in Brazil Major Kerbey made a voyage up the Amazon River of one thousand miles.

Mr. B. A. Hughes, of the Western Union Telegraph Company, San Francisco, Cal., has accepted the agency of Telegraph Age for that city and vicinity, and we hope that our Western Union friends at that point of the Pacific Coast will not overlook Mr. Hughes when they have business with this paper to transact.

Obituary.

James H. O'Donnell, a broker operator, employed at Philadelphia, Pa., died on September 1, of paresis.

G. B. Gaines, aged fifty-five years, formerly in the telegraph and electrical supply business, but for the past three years living in retirement, died at Richmond, Va., on September 13, of heart failure.

M. L. Hellings, aged sixty-eight years, who was identified with the cable service of the Western Union Telegraph Company, with headquarters at Key West, Fla., was killed, September 17, in a railroad accident at Devon, Pa., where he was on a visit.

A New Office at Nashville for the Postal.

What it is believed will be one of the finest and best equipped offices in the system of the Postal Telegraph-Cable Company, is expected to be ready for occupancy by January 1, 1909, at Nashville, Tenn.

The Postal company has been located in Nashville for eighteen years and has occupied and still has offices at the southwest corner of Church street and Third avenue, North. The removal to the new location, in the Noel block, across the street, on the northwest corner, has been necessitated by the rapid growth of the company's business. The company will occupy the entire lower floor of the section of the building on the corner, the basement, and two large rooms on the second floor, these latter to be used as private offices for the officials. The operating department and the business office will be located on the ground floor. Dynamos and other machinery will go in the basement. The two offices upstairs will be thrown together save for a low partition.

The business office will be elegantly fitted up. The floor in front of the railing or desk will be tiled in white, with the word, "Postal," in blue. The desks across which business will be received will be quarter-sawed oak with marble bases. The floor back of the desks will be hardwood all the way through the operating department. The wainscoting around the office will be of oak. From this up to the border near the ceiling the office will be finished in colonial yellow. The ceiling and above the border will be in ivory white. Two handsome electric signs will guide the message sender or seeker to the building by night. One will be swung across the Church street pavement and the other across Third avenue. A big arc light will be over the main doorway. In the lobby in front of the receiving desks or counters, comfortable seats and tables for patrons will be installed.

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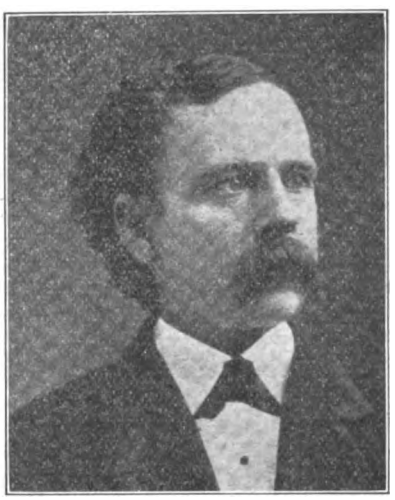
The messenger department will be located in the basement. The boys will receive messages through the rear of the office and go out to the street both through Noel court and Third avenue. The electrical equipment for the new office will be elaborate, the installation of which will be under the direction of James P. Edwards, division electrical engineer, Atlanta, Ga.

A. P. Martin is the manager of the Nashville office; S. E. Elliott, chief operator, and at this point is located the headquarters of Charles B. Arrington, superintendent of the fourth district of the southern division.

Harvey B. Henderson.

Harvey B. Henderson, of Conewango Valley, N. Y., an old-time and military telegrapher, with an excellent war record, is now sixty-six years old, having been born at Manchester, Ill., in 1842. His date of entry into the service of the telegraph was



HARVEY B. HENDERSON,
Conewango Valley, N. Y.

on the Caton lines in 1861, at Jacksonville, Ill., subsequently serving the same interests at other points. He served nearly two years as a United States military telegrapher in the Army of Tennessee under the late Colonel J. C. Van Duzer, of whom he writes: "God bless him! We boys loved and honored him." After the war Mr. Henderson was associated a little while with Colonel A. B. Chandler at Springfield, Ill. Later, at Peoria, Ill., he was a train despatcher for a short time, and then for seven years was employed by the overland telegraph, serving under Superintendent W. B. Hibbard. Since that time Mr. Henderson has been in other business, his health not permitting him to continue any indoor occupation. He, however, keeps up his affiliation with and interest in telegraph organizations, and is a regular reader of Telegraph Age.

Mr. George F. Milliken, inventor of the Milliken repeater, and one of the foremost of old-time telegraphers, now a resident of Boston, in renewing his subscription, writes: "Telegraph Age is always replete with matter of much interest to me, and is highly valued both for its many articles bringing to mind old associations and its up-to-date information on electrical and telegraphic subjects."

The Serial Building Loan and Savings Institution, 195 Broadway, New York, the telegraphers' depository, has always proved a tower of strength in a time of trouble. It offers its services to the telegraph fraternity and invites the close inspection of intending depositors. Out-of-town accounts are solicited. If a home be desired, it liberally aids the depositor in the acquirement of one.

Advertising will be accepted to appear in this column at the rate of twenty-five cents a line, estimating eight words to the line.

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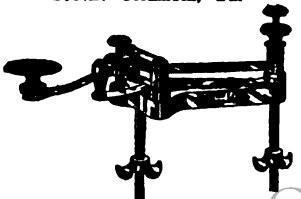

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Postal Telegraph-Cable Co., Executive Offices, 253 Broadway, New York; purchasing agent, W. D. Francis, 14 Desbrosses St., New York.

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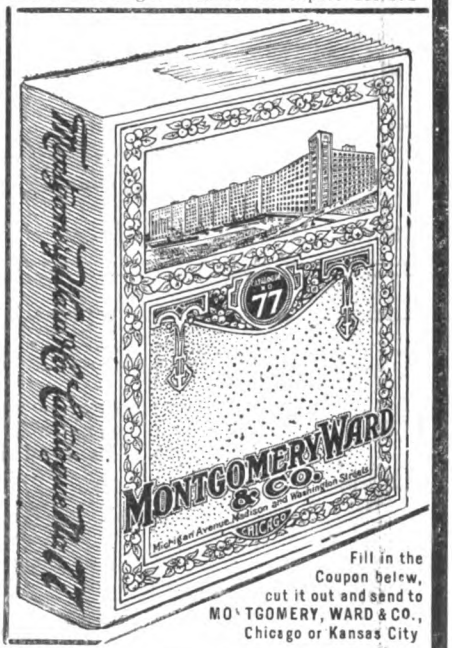

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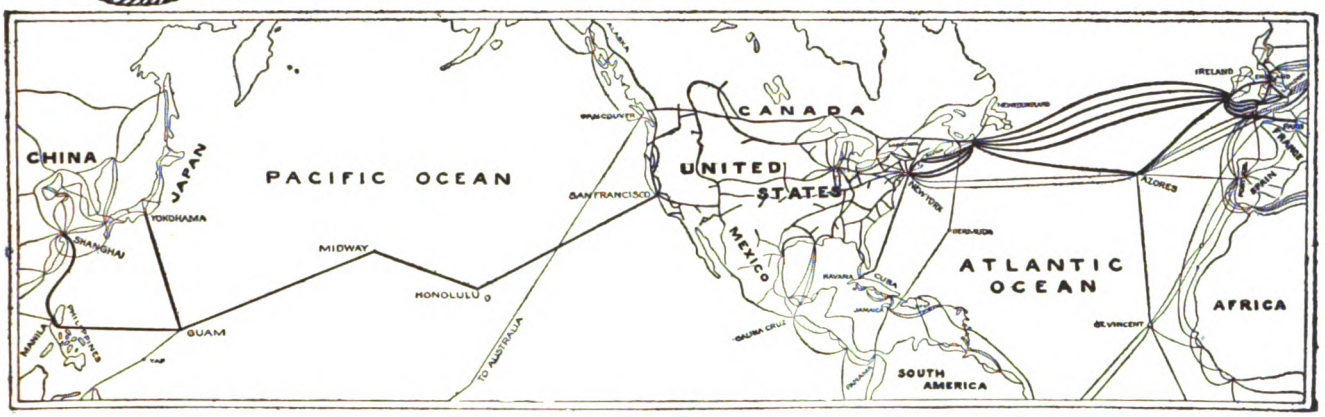

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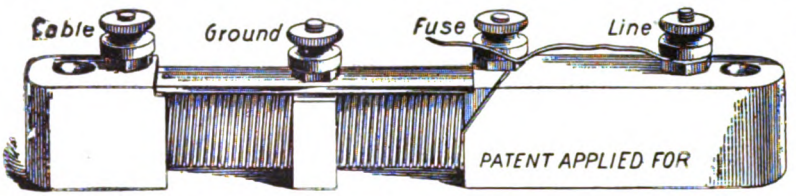

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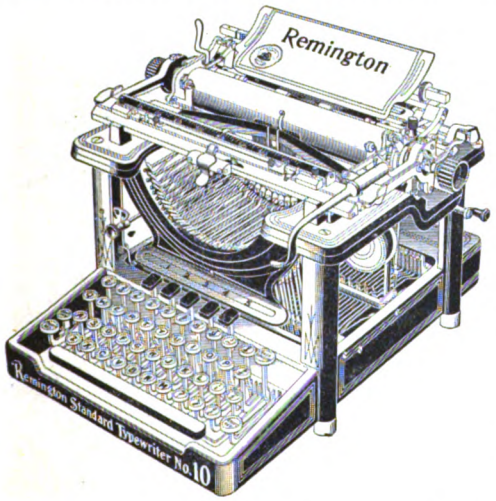

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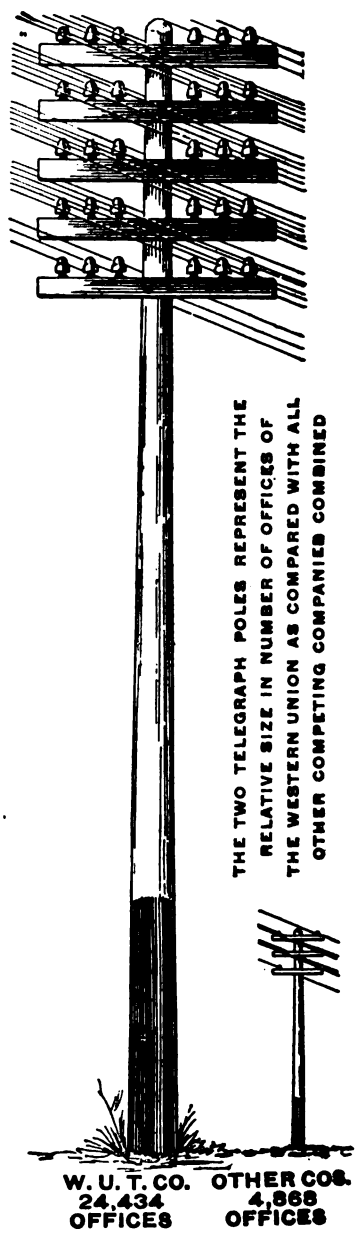

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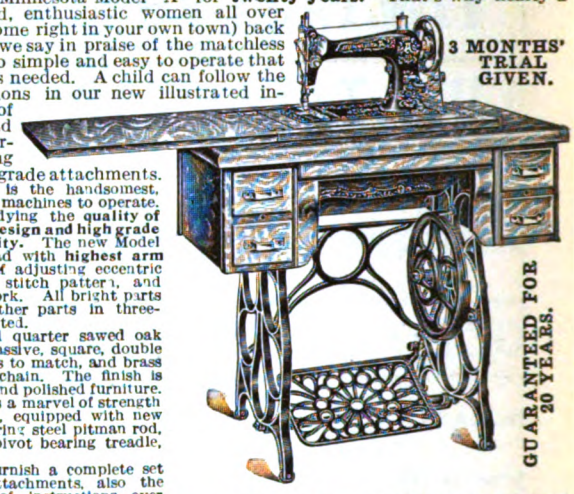

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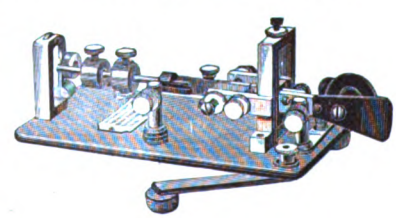

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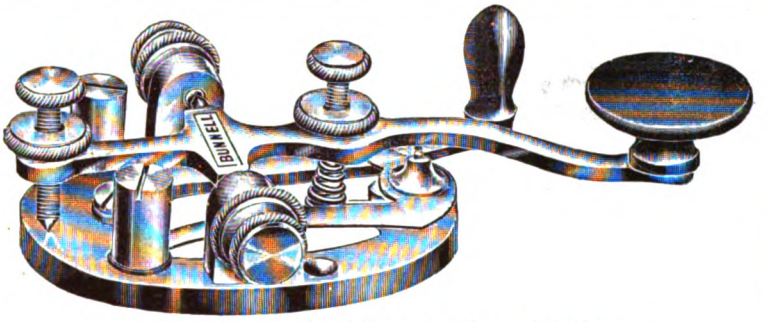

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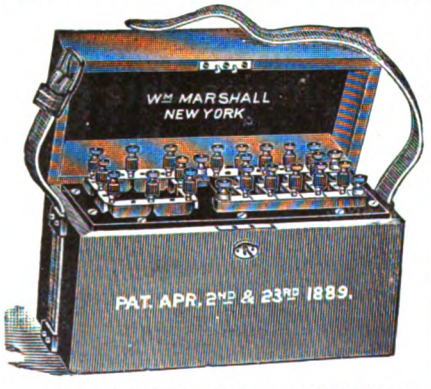

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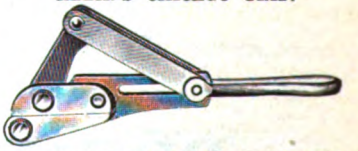

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TELEGRAPH AGE

No. 20. NEW YORK, OCTOBER 16, 1908. Twenty-fifth Year.

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Concerning Inventions.

Nearly every one in the telegraph service at some period of his life has probably been ambitious to invent some device by which he hoped to realize fame or fortune, and, judging by the number of electrical propositions that have been submitted to TELEGRAPH AGE for approval or judgment, the number of aspirants is growing rapidly.

The unfortunate feature of this commendable ambition is that in the great majority of propositions disclosed the efforts made are practically useless so far as their commercial value is concerned, for the reason that the improvement, if any, is usually so slightly marked, compared with the prior device it is intended to displace, that there is really no "long felt want" for it.

Inventors should first realize the fact that no company is going to discard costly apparatus of any description and replace it with new unless it is satisfied that the latter will at least eventually show a monetary gain in their favor. The fact that a new device is "just as good" as one well established is, in itself, no argument in its favor. It must either be decidedly better in all respects, or, if equally efficient and durable, much cheaper. Otherwise the inventor is lucky if he ever realizes the cost of his patent papers.

These remarks are directed principally to that inexplicably numerous class of would-be inventors who seem to think that the most desired electric apparatus which telegraph people are looking for is a good single line repeater! It would seem that the first thoughts of nearly every ambitious young electrician turn naturally in that direction, but why this should be so the writer has never been able to determine.

It may be stated here that since the invention of the old Hicks-Milliken repeater there has never been another invented so much superior to it that any telegraph company would be warranted in expending any great amount of money for the purpose of replacing it with a later type. Not that later types are not "just as good," but because they are not sufficiently better.

As an illustration of this fact one of the most popular repeaters in use to-day went begging for years because there was no demand for it, although its praise was quite general among those called upon for an expression of opinion. The inventor, finding that he could not dispose of it at any price, finally offered it to one of the telegraph companies in exchange for a position as assistant chief operator in order to gain the salary attached thereto. Of course, the proposition was untenable as a matter of business policy. It is interesting to note that no less than five diagrams of new repeaters were submitted to the writer during the past year, soliciting his opinion as to their merits.

Nor is the repeater idea confined to the telegraph profession alone. The telephone offers a wide field for experiments in that line. Fortunately there is a real need of a practical telephone repeater. At present there is no such thing as a telephone repeater in the sense we use the word in connection with Morse apparatus, and from present indications there is nothing even in sight. The so-called telephone repeaters in vogue are merely "boosters" or amplifiers, and hardly warrant the dignity of bearing the name "repeater." Nevertheless, a very great number of useless propositions are constantly being advanced by would-be inventors, only to be turned down because of their utter ignorance of the requirements of such a repeater.

The following reply of a well-known electrician in the telephone service to the question, "Is there a demand for a telephone repeater?" may throw a little light on that subject and give those interested in such an invention a few points of information:

"In connection with the scheme for a telephone repeater, referred to in your note, and information as to whether there is a demand for one, I will say, I think you should first know some of the

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requirements of such an instrument, and then you can judge better of your chances of success. In the first place, such a repeater must allow conversation in either direction. Unlike a telegraph repeater, however, there is no effective current in a telephone circuit with which to operate any mechanical switching device in order to reverse the direction of repetition. Even were such a thing possible it would not be practical, as there is no time for the operation of such a device during the intricacies of conversation. People have a habit of breaking in on each other's conversation and thereby creating conditions so different from those existing in telegraph circuits that it seems improbable that a satisfactory repeater analogous to a Morse repeater will ever be produced. Therefore, instead of wasting your time endeavoring to invent such an instrument, turn your efforts toward devising a good 'booster' or amplifier. The latter seem to be about the only practical instruments to use and, so far, are the nearest approaches to a telephone repeater that have been made.

"There are already one or two very successful instruments of this character now in use in the telephone service, while dozens of others have been patented. You can appreciate the difficulties encountered in devising a repeater or booster when I tell you that in addition to such an instrument being required to operate equally well in either direction, without the aid of switching devices, it must also amplify without distortion the regular conversation on the circuit, but must not amplify the line noises or the telegraph signals that may be simultaneously transmitted over a combination telegraph-telephone circuit. Even these few drawbacks do not cover the field of difficulties to be surmounted, but they should give you a pretty good hint as to what you will be up against before you get through experimenting."

The lesson to be learned from the two cases cited is that if one expects to realize on an invention he must turn his thoughts toward evolving something that there is really a demand for. Strike out in a new field. If you succeed you have no competitors.

Now, there are many things the telegraph companies would be glad to have, and it is not improbable that some day they may secure them, if much of the present ill-directed and thereby wasted efforts previously mentioned could be turned in useful channels.

For example, why not try to devise self-equating apparatus? All multiplex circuits become totally or partially useless when the "balance" is disturbed through leakage or other causes which alter the resistance of the line. We are not aware that any persistent efforts have ever been made in the direction of arranging a compensating device to meet this emergency, nor is there any particular reason to believe that the accomplishment thereof is impossible. But it goes without saying that one who solves the problem will meet with ample reward. It is not only worth trying for, because of the fame and fortune there may be in it, but for the knowledge alone one would gain by studying the many combinations and situations encountered in the operation of a divided current in a duplex circuit.

Of course, automatic methods for cheapening the handling of messages and press matter are always in demand, but the outfit must be of a decidedly practical character throughout, or it will meet with no encouragement on the part of telegraph companies.

Nor is it necessary to confine one's bent to electrical devices alone. There are many opportunities open for operators of a mechanical turn of mind to help the company out and repay themselves at the same time.

It was but recently that attention was called to the indistinct and often undecipherable manner in which operators generally mark off their numbers on the number sheet, and "time" and "letter" the "sent" business with their left hand. Here is a chance for some one to invent a contrivance that will do the work now being done by the operator's left hand, but it should be inexpensive, and something in the line of a rubber stamp with an automatic action.

Of course, a great many needed devices could be mentioned, but that is not the purpose of this article. The cases cited are merely to bring out the point that if one desires to invent anything he should first be sure that there will be a demand for it before wasting time and money.

Recent Telegraph Patents.

A patent, No. 899,209, for an automatic telegraph, has been granted to P. B. Delany, of South Orange, N. J. Automatic telegraph employing a perforating tape at the sending end and recording device at the receiving end. Employs a transmitting tape with three rows of perforations, one for transmitting dots, one for dashes, and a third for grounding the line, and having as many perforations in it as there are perforations in both other rows.

A patent, No. 899,307, for a telegraph sounder, has been issued to Lee Kiblinger, of Jackson, La. Form of sounder having electromagnets with wide flat pole pieces extending directly across the length of the armature lever for the purpose of equalizing the density of the magnet field between the armature and different parts of the pole pieces.

The following patents have expired:

Patent No. 460,109, for a telegraphic transmitting instrument, held by C. G. Burke, of Richmond Hill, N. Y.

Patents Nos. 460,110 and 460,111, for a telegraphic instrument, held by C. G. Burke, of Richmond Hill, N. Y.

Patent No. 460,328, for a printing telegraph, held by J. E. Wright, of New York.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part IX.)

ELECTRO-STATIC BALANCE.

Experience has shown that as a general rule the most satisfactory way to secure a perfect "static" balance under normal weather conditions is by some such arrangement as that illustrated in Fig. 28, where the values of the compensating capacities in the artificial line are represented by the different dimensions of the condensers C, C^1, C^{11}. These condensers, as already intimated, should be so arranged along the line of retarding resistances r, r^1, r^{11}, that the one nearest the polar relay PR, and having the greatest capacity C, will discharge through the least resistance r; whereas the condenser C^{11} of least capacity, and furthest from PR, will discharge through the greatest resistance represented by $r^{11} + r^1 + r$.

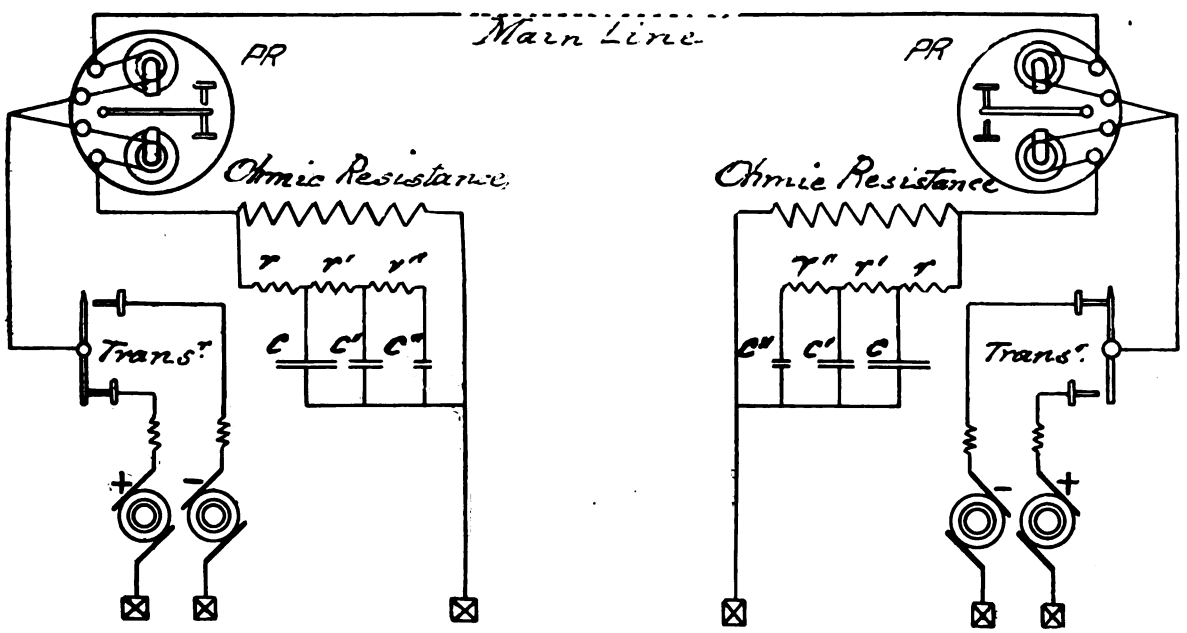

FIG. 28.—NORMAL ARTIFICIAL LINE ARRANGEMENT FOR ELECTRO-STATIC BALANCE.

It is a fact well known that the electro-static condition of a line is more or less affected by variations of weather; so that a knowledge of the climatic conditions existing at the terminal or other points of a circuit, may often prove serviceable as a guide in determining what particular combination of condensers and retarding resistances is best calculated to produce the most effective static balance. A rainstorm or other adverse conditions at the sending end of a line, for instance, will generally occasion a reduction in the number of sheets ordinarily employed in the first of the compensating condensers, and may also call for a similar action in a minor degree so far as the second and third of the series are concerned, because the leakage is so much greater at the insulators under these circumstances, as to favor the discharge of the static electricity at such points, leaving only a diminished quantity to take the regular path to ground by way of the home apparatus.

For similar reasons the static discharges from remote parts of the line are less voluminous when bad weather prevails at, or in the immediate neighborhood, of such parts, and on this account the capacity of the condensers at what may be regarded as corresponding positions in the artificial circuit will be required to be adjusted to the altered conditions in the main circuit. And, since one of the effects of leakage is to practically increase the conductivity of the main circuit, and to thus promote discharge, it will be evident that the amount of resistance in the retarding coils of the artificial line may have to be reduced, so that the time, as well as the distribution of the condenser discharges, shall be more nearly in unison with the shorter periods required to discharge the main line in wet weather.

This time factor is a most important consideration on automatic circuits of considerable length, especially if the conductor has one or more underground sections in it. For, under such circumstances, the main line will receive and part with its charge much more slowly than the condensers, and a proper working balance for high speeds will not be obtained until the charge and discharge from each are not only alike in amount, but correspond in duration. As a general rule, the electro-static capacity of a line is higher and less liable to fluctuate in dry than in wet weather; although it may occasionally be noticed that the condensation of moisture upon the cross-arms, insulators, etc., under slightly moist conditions, will temporarily increase the inductive capacity of the line.

The amount of electricity that accumulates upon a conductor is always greatest in very dry and frosty weather, when the dielectric properties of the air are a maximum, and the leakage at the

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points of support a minimum. But, since the circuit is generally quite constant at such times, there is little or no difficulty in obtaining the necessary equations, and of maintaining the highest possible rate of speed that the inductive capacity and resistance of the wire will admit of.

A bad escape at one or more points in a circuit is very apt to produce a variable static disturbance—especially in damp or wet weather—and the utmost difficulty may then be experienced in holding the balance sufficiently steady to admit of the maintenance of working at other than slow speeds. It is always advisable at such times to have the wire changed, or cross-connected with some suitable Morse wire, rather than lower the carrying capacity of the automatic circuit. This may generally be accomplished without detriment to the working of the Morse circuit, inasmuch as the static fluctuations that are so fatal to the operation of high-speed circuits seldom prove serious enough to practically interfere with the hand-working of the Morse apparatus.

It is, of course, impossible to be cognizant of, or to anticipate all the changes and variations that are liable to affect a circuit from natural or other causes; and, for this reason, disturbances of the balance will frequently occur that cannot be counteracted by methods suggested from the partial knowledge possessed of the condition of the circuit. In such cases, the only guide to an accurate reproduction of the unknown conditions prevailing in the main line will be that afforded by the appearance of the incoming signals during the initiatory stages of balancing the wire.

Should there be a repeater in the circuit, it will always be well to determine in which of the two sections the irregularities that appear exist, otherwise much valuable time may be—and, as a matter of fact, often is—lost, through the ineffectual efforts to counteract them by taking balances at the home station, when the trouble in reality is on a part of the line that can only be compensated for at the repeating station. It would, of course, be quite possible to strike a balance without calling in the latter, provided the disturbance originated in the stretch of wire between the home and repeater offices; and this in point of fact is frequently done, but if after a reasonable length of time a satisfactory equation cannot be secured in this way, it may be fairly assumed that the trouble is beyond the repeating office which alone can remedy the fault.

It sometimes happens that the repeater chief, from one cause or another, is more or less unconscious of the static irregularities that are so manifest at the terminal station, and under such circumstances differences of opinion are apt to arise between the two offices as to the particular locality of such trouble. In cases of this sort, it is possible for the terminal office to definitely determine the point at issue, by having the repeater office first open and then close the switch inserted in the further section of the line. The latter will in this way become alternately simplexed and duplexed, and thus enable the terminal office to note whatever difference may be apparent in the incoming signals under these different conditions.

If, for instance, A and C are the terminal points of a duplex circuit running east and west in which a repeater is inserted at B, the opening of the switch on the western side of B's repeater will allow the currents from C to be repeated to A, but not vice versa, as the latter signals are now prevented from passing beyond the repeater B. If the signals from the west, now that the eastern section alone is duplexed, come clear and perfect when the home transmitter is allowed to run, but are ill-defined and irregular when B's switch is closed, and the entire circuit once more duplexed, it will be proof conclusive that the western portion of the circuit needs a fresh balance.

(To be continued.)

Personal.

Mr. Fred G. Boyer, superintendent of telegraph of the Standard Oil Company, Oil City, Pa., was a recent New York visitor.

Rev. T. E. Ragsdale, a Cincinnati, O., operator, has left the telegraph service to become assistant pastor of the Central Christian Church of that city, and will hereafter devote his life to religious activities.

Mr. William H. Baker, former vice-president and general manager of the Postal Telegraph-Cable Company, whose home is at Bayside, fronting on Little Neck Bay, Long Island, derives much pleasure from yachting, a form of recreation in which he has become a warm adherent.

Mr. J. K. Butler, who in the seventies was one of the most efficient and popular Western Union managers in New England, and subsequently an extensive builder of telephone lines throughout that section, and whose business interests now center in Boston, has recently bought a summer home at Hebron, near Yarmouth, Nova Scotia.

Mr. Patrick B. Delany, of South Orange, N. J., the inventor of the system of automatic telegraphy known as the Telepost, has received as an award therefor, the Elliott Cresson gold medal, from the Franklin Institute of Philadelphia. This was conferred as a result of the findings of the sub-committee of science and arts composed of E. Alexander Scott, chairman; Carl Hering, William O. Griggs and Richard L. Binder. The report of this committee is published in the October issue of the Journal of the Franklin Institute.

Mr. John A. Sleicher, the proprietor of "Judge" and of "Leslie's Weekly," in the late seventies, was in the employ of The Associated Press, at 195 Broadway, and for several years filed the press report that was furnished to the New York state newspapers, and is well remembered by many of the older of the employes of The Associated Press. Mr. Sleicher is regarded as one of the foremost newspaper managers in this country to-day, and since he acquired control of the two papers named, their circulation and standing has been materially added to.

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At a meeting at the City Hall, called by Mayor McClellan on October 8, to consider the preliminaries of the proposed Lincoln celebration on the one hundredth anniversary of his birth, February 12, 1909, among those present were: David Homer Bates, Charles Almerin Tinker and Colonel Albert B. Chandler, war department cipher operators during the war, the "sacred three" as they are called, whose association, by reason of their occupation, with the War President was intimate, being of a highly confidential nature. General Thomas T. Eckert, the venerable ex-president of the Western Union Telegraph Company, and who was at the head of the military telegraphers, did not feel sufficiently strong to attend.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Mr. Charles P. Bruch, third-vice-president, and Mr. E. B. Pillsbury, general superintendent of the eastern division, have returned from a trip of inspection to Buffalo and Pittsburg.

Mr. Harvey D. Reynolds, superintendent at Buffalo, was a visitor at headquarters last week, coming hither on business connected with the service.

Mr. Charles E. Bagley, superintendent at Pittsburg Pa., and who was recently elected vice-president of the Old Time Telegraphers' and Historical Association, was a business visitor here last week. He was accompanied by his wife.

The improvements now being made in the rearrangement of space of the first floor or entrance corridor, will result in materially altering the appearance of that spacious and handsome hall. It was determined upon mainly because of the necessity of providing larger and more convenient quarters for C. F. Leonard, superintendent of city offices, now located on the ninth floor. At the same time it will afford additional room for the cashier's, delivery and receiving departments, so long confined to narrow offices partitioned off from the open, on the Murray street side. This divisional rearrangement has necessitated the removal of two central booths, hitherto occupied as bootblacking and newspaper stands.

RESIGNATIONS AND APPOINTMENTS.

Mr. J. W. Weed, manager at Elmira, N. Y., has been promoted to the managership of the Syracuse office, vice C. A. Balsley, transferred to New York. W. L. King, of the Elmira office, has been made manager to succeed Mr. Weed.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Among the recent executive office visitors were Sidney B. McMichael, general assistant of the Great North Western Telegraph Company, Toronto, Ont.; Theodore P. Cook, general superintendent at Chicago, accompanied by his private secretary, M. T. Cook; Jacob Levin, general superintendent at Atlanta; W. W. Ryder, superintendent of telegraph at Chicago, and V. T. Kissenger, assistant superintendent of telegraph at Lincoln, Neb., of the Chicago, Burlington and Quincy Railroad.

A party made up of Superintendent R. T. Reid, of Seattle, Wash., Manager A. T. West, at that place, and Manager J. F. Rawie of Portland, passed Saturday, September 26, at Spokane, Wash., in conference with Manager B. S. Jones, of that point, and in an inspection of his office.

The Barclay printing telegraph system has been extended to cover circuits between Denver-Chicago, Nashville-Cincinnati, and Nashville-Chicago.

General Louis Fitzgerald, aged seventy years, who for many years was a director of this company, died October 6 at his country home at Garrison-on-the Hudson, N. Y.

At the annual meeting of the Gold and Stock Telegraph Company held September 29, the retiring directors were re-elected. These are: R. C. Clowry, Thomas F. Clark, George H. Fearons, George J. Gould, John T. Terry, J. B. Van Every, J. C. Barclay, Edwin Langdon, Howard Gould and G. W. E. Atkins. On October 1, the directors met and elected the following: R. C. Clowry, president; Thomas F. Clark and G. W. E. Atkins, vice-presidents; A. R. Brewer, secretary, and M. T. Wilbur, treasurer.

Much sympathy is expressed for Charles M. Holmes, the faithful executive messenger who has been in the service of the company for over thirty-eight years, because of the condition of his son, William O. Holmes, who was stricken with total paralysis four weeks ago.

J. F. Rawie, Western Union Manager at Portland, Ore.

J. Franklin Rawie, manager of the Western Union Telegraph Company, at Portland, Oregon, the appointment to which was noticed in our September 1 issue, is a native of Canton, Ohio,

J. FRANKLIN RAWIE,
Manager Western Union Telegraph Company, Portland, Ore.

where he was born January 27, 1868. Beginning as a messenger in 1882, in the local telegraph office, he eventually acquired a knowledge of the

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dots and dashes. In 1890 he became identified as an operator with the Louisville, Ky., office of the Western Union Telegraph Company, from which he was promoted in 1891, to the managership of the Roanoke, Va., office, a position he continued to hold for thirteen years. In November, 1894, he was sent back to become manager at Canton, where twenty-two years previously he began his telegraphic career. His stay here was short, however, for in May, 1905, he was further promoted to take charge of the Toledo office. In May of the present year he went West to Tonopah, Nev., to be transferred after three months' service to his present position at Portland, as first stated. As an operator Mr. Rawie early became well informed and proficient. Devotion to duty and proved executive ability have long kept him in the managerial chair.

The Annual Report of the Western Union Telegraph Company.

The annual report of the president of the Western Union Telegraph Company for the year ended June 30, 1908, shows that the capital stock outstanding is $99,817,100, of which $30,131.51 belongs to and is in the treasury of the company.

The bonded debt at the close of the year was as follows:

Funding and real estate mortgage bonds due May 1, 1950, four and one-half per cent.	$20,000,000.00
Collateral trust bonds due January 1, 1938, five per cent	8,645,000.00
Convertible redeemable bonds due November 1, 1936, four per cent.	10,000,000.00
	$38,645,000.00

	Year ended June 30, '07.	Year ended June 30, '08	Increase.	Decrease.
Revenues	$32,856,406.25	$28,582,212.09		$4,274,194.16
Expenses	26,532,196.20	25,179,215.33		1,352,980.87
Net revenue	$6,324,210.05	$3,402,996.76		$2,921,213.29
Interest on bonds.	1,420,061.00	1,732,250.00	$312,189	
Profits	$4,904,149.05	$1,670,746.76		$3,233,402.29
Appropriated for cash dividends.	4,868,096.25	1,714,571.50		3,153,524.75
Surplus	$36,052.80	$43,824.74*		$79,877.54

* Deficit.

Surplus July 1, 1907	$16,884,781.18
Less deficit as above	43,824.74
	$16,840,956.44
Less appropriated for stock dividends	2,447,100.00
Surplus June 30, 1908	$14,393,856.44

The net growth of the plant was: in poles and cable, 2,831 miles; in wire, 38,231 miles; in offices there was a decrease of 907, due principally to the fact that railroad companies have closed many small telegraph offices in consequence of the enactment of laws shortening the hours of labor. At most of such places messages are accepted and telephoned to an office of this company to be forwarded to destination.

Of the total of 1,359,430 miles of wire at the close of the year 485,801 miles were of copper and 873,629 of iron; an increase in copper of 66,351, and in iron a decrease of 28,120 miles during the year, due to the substitution of copper for iron.

The number of messages decreased 12,433,264, and the revenues of the company decreased $4,274,194.16, due to the depression in business and to the strike of operators, which began early in August and lasted until November 7, 1907. The average tolls per message transmitted by the company were the same as the previous year, but the cost was increased by the strike to such an extent that that branch of the business showed a small loss for the year. This loss ceased as soon as conditions became normal. Notwithstanding the abnormal expense during the strike, the expenses for the year were reduced $1,352,980.87, which left the net loss in revenue $2,921,213.29, as compared with the previous year. The decline in gross receipts is proportionately less than that which followed the panic of 1893, the low receipts of which period were succeeded by many years of growth. This it is hoped will be the case in the present depression, and there are at this writing indications of improvement manifested by demands from many different sections of the country for help to handle increasing traffic.

For the past six years liberal appropriations have been made for the maintenance of the company's lines. The plant is, therefore, in good condition. As stated in the last annual report, much of the work of improving the property of the company had been completed before the close of the fiscal year, 1906-07. There has followed, as anticipated, a material decline in the demands for such work which has permitted a substantial reduction in expense.

The automatic printing telegraph, owned by the company, and mentioned in the last report as having been put in operation at many of the principal cities, has been further extended to Washington, Cleveland, Cincinnati, Kansas City, St. Paul, Omaha, Denver and Nashville.

The Cable.

Cable communication was interrupted October 14 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Macao	Aug. 29, 1908

Messages can be mailed from Hongkong.

Mr. F. N. Dresing, foreign advisor to the Chinese telegraph administration, and a delegate from that country to the International Telegraph Conference, held lately at Lisbon, and who has an international reputation in telegraph and cable circles, while stopping at the Imperial Hotel, Tokio, Japan, en route to China, on his return from Europe via the United States, suffered the loss of his money and all of his official papers and decorations by robbery.

At the conference of the Association of Chambers of Commerce at Cardiff, Wales, September 15, a resolution was passed urging the reduction of foreign and colonial cable rates, a tariff of one penny per word being suggested for France, Belgium, Holland and Germany. Some wild statements were put forward regarding the maximum capacity of the Atlantic cables and their actual traffic, the arguments of Mr. Henniker Heaton being quoted. One member objected to any reduction in the cost if it were likely to interfere with the efficiency of the service,

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and stated that he had to send cable messages via New York for quick delivery at Havre, France.

The Colonial Secretary of Bermuda, in a recent report, states that there is no inland telegraph in that island. An efficient telephone service throughout the colony is worked by a private company. The cables of the Halifax and Bermudas Cable Company, Limited, and the Direct West India Cable Company, Limited, both of which companies are under subsidies from the English Government, connect Bermuda with the outside world through Halifax on the one hand and Turk's Island and Jamaica on the other. The cable to Halifax was laid in 1890, and that to Turk's Island and Jamaica in 1898. The company also have a cable between Hamilton and St. George's for the use of the public.

Sir Samuel Canning, aged eighty-five years, one of the best known men actively connected with submarine telegraphy in England since 1850, died September 24. In giving the history of his life the London Electrical Review says: He was born at St. Andrews, in Wiltshire. In the year 1855 he laid the Cape Breton Isle and Newfoundland telegraph cable, and in 1857 and 1858 his services were secured by the Atlantic Telegraph Company as consulting engineer to Sir C. Bright, and as one of the engineers-in-charge for the laying of their Atlantic cable. In 1865 he was appointed engineer to the Telegraph Construction and Maintenance Company, and in that capacity he superintended the manufacture and laying of the Atlantic cables of 1865 and 1866. Probably his greatest achievement was the work he performed in connection with the recovery of one of those cables, a feat which he accomplished as engineer to the contractors in the Great Eastern. He fitted out that vessel for the purpose, and had the control of the expeditions. He also connected England with Gibraltar, Malta and Alexandria, and laid other important lines of cable connecting various countries in the Mediterranean, North Sea, etc. In 1866 he received the honor of knighthood, at the same time a similar honor was conferred upon William Thomson, who afterwards became Lord Kelvin. In the following year a gold medal was awarded to him by the Chamber of Commerce in recognition of his valuable services. The Insignia of the Order of St. Jago D'Espada was received from the King of Portugal. Sir Samuel acted as consulting engineer to the West India and Panama Telegraph Company, and was a co-operator with the late Mr. W. O. Callender in the first days of Callender's Cable and Construction Company.

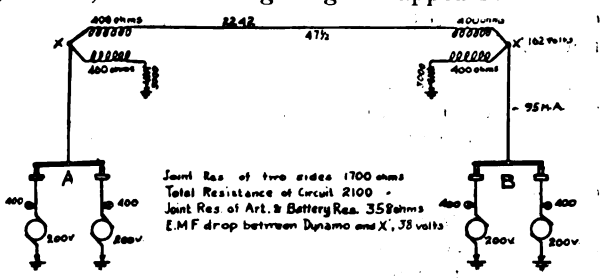
The Mexican Federal Telegraph Company has just occupied new and commodious quarters on Plaza de Libertad, at Tampico, Mexico.

"I have nothing but good words to say for Telegraph Age," is the way Mr. R. C. Smith, general superintendent of the Anglo-American Telegraph Company, at St. John's N. F., speaks of this paper in renewing his subscription for another year.

A Study of the Duplex Circuit.

(Contributed.)

On page 389, Telegraph Age, of the issue of June 16, the following diagram appears:



Suppose a line wire of 3,342 ohms should be substituted for the wire of 2,242 ohms, shown in the diagram, Fig. 1, what resistance should be unplugged in rheostats at A and B to balance? And what is the simple rule for calculating it?

The rheostats have 3,000 ohms to balance a line wire of 2,242 ohms. After adopting a resistance of 3,000 ohms for rheostats to balance a wire, it is easy to calculate the resistance of the wire, but to calculate the resistance of the rheostats to balance a wire of a given number of ohms is not so easy.

Permit me to show a method of readily solving the problem in Fig. 2.

Line = { Relays... 800 / Line wire . 3432

4232 ohms = l

Battery resistance 400 ohms = r

$$\frac{1}{2} + \sqrt{\left(\frac{1}{2}\right)^2 + (1 \times r)} = R$$

l = 4232 = Line wire and relays.

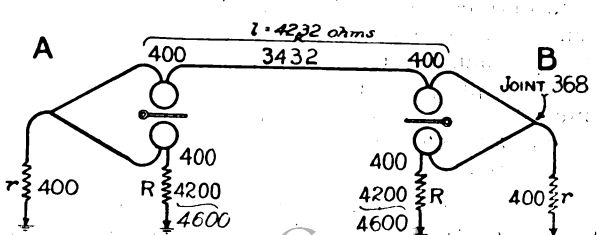
$\frac{1}{2} = 2116$

r = 400

$\left(\frac{1}{2}\right)^2 = 4477456$

r × l = 1692800

2	6.17.02.56 / 4	2484 + 2116 = 4600 / Deduct relay 400
44	217 / 176	4.200 = Rheostat
488	4102 / 3904	
4964	19856 / 19856	



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Radio-Telegraphy.

A patent, No. 899,264, for an oscillation detector, has been granted to Charles E. Russell, of Cambridge, Mass. A magnetic detector which does not require a cyclically varying magnetic field.

A patent, No. 899,272, for apparatus for determining the direction of space-telegraph signals, has been secured by John Stone Stone, of Cambridge, Mass. System whereby the bearing or direction of the transmitting system from the receiving system may be determined by observing at the receiving station the direction of motion of the electromagnetic waves which emanate from the transmitting system.

A patent, No. 899,243, for space telegraphy, has also been obtained by Sewall Cabot, of Brookline, Mass. A form of detector for use with the above system. Has a dynamo electric machine with field coils and an armature winding, means connecting said armature winding and said field coils in series, a condenser in series with said field coils and armature winding, and means for varying the magnetic flux threading said armature winding by the electrical oscillations to be detected.

A patent, No. 899,239, for a signaling system, has been issued to Sewall Cabot, of Brookline, Mass. Wireless telegraph system which may be operated in connection with existing wire telegraph systems without changing any of the operating features thereof. Designed to be operated so as to automatically bridge by wireless telegraphy any gaps which there may be in the wire line due to intervening property rights or the like. Additional patents, Nos. 899,240, 899,241 and 899,242, relating to other features of same, have also been granted.

Recently a demonstration of typewriting by wireless telegraphy was given at the Hotel Cecil, London, by Mr. Hans Knudsen, the inventor of the system. The method adopted, says the Electrical Review, of London, involves perfect synchronism between the sending and receiving apparatus; this having been attained, the transmission is effected by means of traveling contacts at either end of the system, a set of keys at the sending end, and a corresponding set of coherers and relay circuits at the receiving end in connection with a typewriter. At the moment when any particular key is pressed at the sending end, only the corresponding circuit is closed at the receiving end, and, therefore, only that circuit can respond. Thus, so long as perfect synchronism is maintained, and the speed of the traveling contacts is sufficiently great, a typewriter or typesetting machine can be actuated from a distance by telegraphy, wireless or otherwise. The principle of distributive telegraphy is well known, but its application to wireless telegraphy appears to be novel.

A reply to the criticisms of Branly on thermoelectric detectors, by C. Tissot, is thus abstracted from the Comptes Rendüs by the Electrical World: "It is pointed out that tellurium detectors work without a battery, and are, therefore, not based upon a mere coherer effect. When they are connected with the antenna in parallel with a galvanometer, the galvanometer shows a deflection when waves impinge upon the system. The latter would hardly produce the unidirectional effect described if the detector simply operated by a variation of the closeness of the contact. Another characteristic difference is that the thermoelectric detectors respond, not in accordance with the amplitude of the variation of potential, but in accordance with the mean energy impinging upon the system. This may be proved by measuring the energy with a bolometer, an instrument by means of which detectors may be tested quantitatively. Good results are also obtained with other substances occupying extreme positions in the thermoelectric series, notably with fused sulphide of copper and its natural variety (chalcosine), as well as Becquerel's alloy, containing ten parts bismuth and one antimony. The thermoelectric detector may be described as a 'total-effect' instrument. It has properties which fit it in a special way for the receipt of signals in selective telegraphy and in wireless telephony."

Mrs. Tillotson Remembers Telegraph Interests.

Mrs. Emma A. Tillotson, of New York, lately deceased, widow of Luther G. Tillotson, disposed of an estate said to amount to $2,000,000. Her benefactions were numerous. Among the bequests was one of $5,000 to the Telegraphers' Mutual Benefit Association, of New York, and another of like amount to her husband's namesake, Luther Griffith, who is the son of one of Mr. Tillotson's old telegraph operators employed on the Erie Railroad in the early seventies. Mrs. Tillotson was widely known to many of the older members of the telegraph fraternity, by whom she was highly esteemed. Mr. Tillotson's father was a pioneer in the construction of telegraph lines in the Western States, and it was in that section that Luther G. Tillotson, while yet a boy, learned to operate the telegraph. Eventually he became superintendent of telegraph of the Erie Railroad. In 1862 he established in New York the firm of Tillotson and Company, dealers in railway and electrical supplies. In 1865 he entered into partnership with General E. S. Greely, of New Haven, and H. W. Holt, and founded the L. G. Tillotson Company, which afterwards became one of the largest telegraph and railroad supply companies in the country. Mr. Tillotson died January 31, 1885, when fifty-one years of age. The business of his concern then passed under the control of E. S. Greely and Company, the successor of which, in part, is the present house of Foote, Pierson and Company.

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Efficiency of the Signal Corps and Aeroplane Development.

The efficiency of the Signal Corps of the Army of the United States, which the alertness and fine intelligence of its officers constantly aim to secure and permanently maintain, has become the subject, and justly so, of much favorable remark. Not only is this true in our own country, but the fact is attracting much attention abroad. Not long since a foreign military officer of high rank paid a merited compliment to the American signal corps, pronouncing it to be in advance of anything in Europe, dwelling particularly upon the numerous and important experiments undertaken by it in connection with wire and wireless telegraphy, telephony and ballooning. Foreign army officers generally credit the signal service of the United States with receiving generous financial support from the Government for experimental purposes, declaring that in other countries a more conservative policy prevails to, by comparison, the consequent detriment of such service. Be this as it may, the American corps is entitled to further commendatory remark by the very praiseworthy interest it is manifesting in the aeroplane, or flying machine, in the series of interesting yet severe tests lately conducted under government auspices at Fort Myer, Va., near Washington. Although disaster, resulting in the wreck of the aeroplane, the killing of Lieutenant Selfridge, and the serious injury of Orville Wright, the inventor, has brought the tests to a close for the present, the Signal Corps will proceed with its aeronautical work, and it is understood that the Wright brothers will be permitted to make their official trials whenever they are ready, without endangering their chance of receiving the contract price of $25,000 for their aeroplane.

A writer in the Western Electrician, in an article referring to the Wright aeroplane, says: "It has been generally admitted the world over that if a successful aeroplane were developed it would probably prove to be the connecting link through which wireless telegraphy and telephony would greatly, if not entirely, change methods of warfare. The dirigible balloon is nothing more than a balloon with a propeller and practically is at the mercy of even a comparatively light breeze, while a bullet or shot puncturing its thin sides might be sufficient to bring about its destruction. If successful, the aeroplane would not only be navigable with and against the wind, but would be at the same time probably practically bullet-proof, in that a small shot hole through any one of the planes of the aeroplane would have but little effect on its flight. In view of these facts the results of the tests made with aeroplanes chiefly by the Wright brothers and Mr. Herring at Fort Myer, have assumed a world-wide importance." Orville Wright has conclusively demonstrated the ability of his machine, for it remained up in the air at one of the tests for over an hour, exhibiting qualities of great speed, estimated at over thirty-seven miles an hour, and ease in maneuvring, thus practically fulfilling exacting government requirements. How severe these are is shown by the Signal Corps specification, No. 486, successfully meeting which makes the work accomplished by Mr. Wright all the more creditable.

A movement to increase the strength of the army Signal Corps has taken definite form in the shape of a bill now before the military committee of the Senate.

The Signal Corps is now a staff corps and has a quota of 1,200 officers and men. The bill awaiting the action of Congress provides for a full peace strength of 2,500 officers and men, and if passed will put the Signal Corps in the line of the army. Military experts estimate that two and one-half per cent. of the entire force of an army is the minimum that can safely be used for signal work. The present strength of the Signal Corps is slightly more than one per cent. of the authorized strength of the army in time of war.

The officers and men of the Signal Corps require a great amount of special training. Their work involves the establishment and maintenance of cable, telegraph and wireless systems, the installation of fire control systems in all fortifications, military aeronautics, cable and telephone equipment, participation in military maneuvers, and all signal work.

The construction of the Washington-Alaska military cable, its maintenance, the operation of the Philippines cable and of telegraph and wireless lines in Alaska, Cuba, the Philippines and the United States, has required the services of a large percentage of the force of the Signal Corps.

Among a number of books on the market treating of the general subject of train despatching, that bearing the generic title of "The Train Dispatcher," written by A. W. Early, a train despatcher himself, has gained a wide popularity, its value being based on the fact that it is one of the best books of the kind ever produced. It supplies a certain practical information of a class desired by the ambitious worker as a guide and inspiration to him in his daily work. Its 104 well printed pages are packed full of educatory matter, and the volume should be, as it has been, a welcome possession to every telegraph operator and train despatcher in the railway service. This book will be sent to any address on receipt of price, $1.00. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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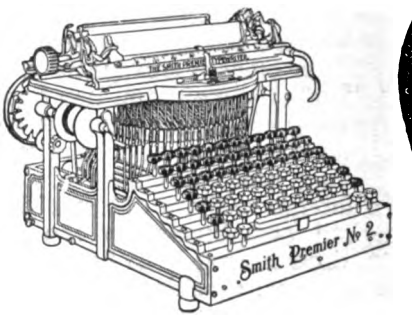

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OCTOBER 16, 1908.

The Book Department of TELEGRAPH AGE has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The Exercise of a Loyal Purpose.

Loyalty to employing interests, those governing one's occupation, the source from which payment for services is derived, the means of livelihood obtained, indicates character, fidelity of purpose, moral attributes that no employer, no matter what deficiencies may exist in his own personality, is unmindful of. Honesty, lofty resolve and untiring zeal, coupled with intelligence, should never permit a man, if health remains, to "beg his bread."

It has sometimes been said, not always wisely, that "the world owes every man a living." It does if he earns it; not otherwise. We are all anxious to get ahead. As a means to an end if all telegraphers, men and women, would consider themselves solicitors, or solicitous spokesmen, for their respective companies, much resultant good might be accomplished. It is not necessary to make an ostentatious display of energy; what we mean is that if each person in the telegraph would take it upon himself or herself to stand by it, to defend it, when assailed, as a great carrying corporation deserving of confidence, an act of practical benefit would be conferred. For it has become the habit in these latter days on the part of many to pass uncalled for and indiscriminate criticism not only upon the telegraph, but equally so upon other great corporate institutions that have come to fruition in this country. Such censure, sometimes deserved, but more often uttered without adequate knowledge of existent facts, following unfortunately a disposition, too prevalent at this time, to sit in judgment upon men, measures and methods of business conduct, with which the average lay person, as we meet him, is not always the most competent pronounced upon, should be met and overcome.

It is not unusual to hear the telegraph reprehended, sometimes roundly so, on the theory that it fails to transmit and deliver its messages promptly. Now, every telegrapher knows the injustice of such complaint; he knows that such statements are at variance with facts, in other words, that they lack the element of truth. In the vast amount of business handled it would be strange indeed with so many conflicting elements to deal with, that some errors did not occur, that some delays were not encountered. But as compared with the whole, failures are few. It may be doubted if they amount to two per cent. Ninety-eight per cent. out of every hundred telegrams reach their destination promptly, without delay. Where—in what other line of business will, as a matter of fact, a less shortcoming out of a given total be observed? Yet the two per cent. deficit, small as it is, is largely responsible for very much of the criticism heard respecting the telegraph. The infinitesimal annoyance represented in this low maximum of two per cent. is permitted to overshadow the giant and excellent service the telegraph is constantly rendering. A typographical error will frequently call forth more petty adverse remark than the otherwise strong and dignified statement in which it occurs, will receive recognition. Such experiences serve to remind us that human nature is much the same wherever encountered.

The point we desire to get at is this: Telegraphers have it within their power to materially offset this hostile sentiment to which we have referred, to render the telegraph companies a great and abiding service. If, when occasion demands, voices were raised in defense of the telegraph, explanatory in averment, speaking the exact truth, and proclaiming it with dignity and enthusiasm, thus meeting and repelling misstatement and gratuitous slander, cheap, oh, so cheap! a new era would dawn upon the telegraphic horizon. Such united expressions would tend to confer specific benefits in vindicating the telegraph companies, would clarify the atmosphere of public under-

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standing, and cause a more enlightened point of view to obtain.

Men and women who draw their sustenance from the telegraphic purse, owe this much in allegiance to the companies, giving them employment. The retroactive influence of such a course on the individual would be considerable. Try it and watch the results. A new era of prosperity, and of good will between every grade in the service would be likely to follow. Fifty thousand or one hundred thousand persons following out the suggestion here outlined, would constitute a tremendous force towards moulding favorable public opinion. It is not too much to say that the telegraph has a right to expect such action on the part of its employes. Let enthusiasm prevail in the service rather than a dull listlessness, an interest directed only by the extent of the wage received! What a magnificent exhibition of *esprit de corps* would attend such a resolve and display of loyal purpose!

May Retaliate Against British Patent Law.

The International Congress for the Protection of Industrial Property, which began its sessions at Stockholm, Sweden, on August 28, took up the discussion of the British patent act in its effect on foreign countries. About three hundred and fifty delegates were in attendance, including twenty-one official delegates, who represent that number of foreign countries. Edward B. Moore, United States patent commissioner, is quoted by cable as saying:

"The result of the discussion on England's new patent law will probably be that the majority of nations belonging to the International Patent Union will enter a protest against it and recommend to the official congress to be held next year in Washington that some sort of retaliatory combination against Great Britain be formed whereby great Britain must either become a party to their proposition or be excluded from all benefits to be derived from such a combination."

Under the new law all articles patented in Great Britain and intended for the British market must be manufactured in that country, and the attempt on the part of the congress to have the law modified is of particular interest to American manufacturers of electrical and other machinery largely used in British factories, who, having obtained the patent rights in Great Britain, continue to supply British factories with machines and devices made in the United States.

The year of grace given foreign patentees under the British law closed August 28, and henceforth foreign patents may be revoked in Great Britain unless the patented article is manufactured or the patented process is operated in the United Kingdom to an adequate extent.

A great number of foreign firms have already bought sites and started works in Great Britain, many others are making arrangements to do so. These are mainly German and American firms. It is estimated that $125,000,000 will thus be invested for the manufacture of articles formerly manufactured abroad, and a prominent expert in patent law thinks that no fewer than 8,000 patents granted to foreigners will come under the new law. Meanwhile British newspapers and workmen are congratulating themselves on the benefits they foresee for home industry.—Western Electrician.

The Harvard Building Association.

The Harvard Building Association, of Boston, organized and maintained in the interest of telegraphers, affords a very pertinent illustration of what may be accomplished by intelligent co-operation and earnest effort. In 1898, eleven telegraphers, following a general discussion of the subject held at two or three preliminary meetings, met and organized the association named. Each one present contributed $5, thus establishing a capital of $55. It was a modest sum with which to start out in an endeavor which had for its purpose an important beneficial undertaking. But there was determination behind the scheme, and serious-minded men stood by pledged to give personal service in directing its affairs. A plan of operation had been carefully devised, ideals were not wanting. A resolution to succeed was the actuating impulse of those engaged in this initiative. At the outset Mr. Frank T. Viles was chosen secretary, a position he has since retained. This was ten years ago. With a membership limited to twenty a fine degree of prosperity has been attained. A spirit of thrift has been engendered. The tenth annual report, just at hand, records an excellent showing. It appears that the association during its single decade of existence has demonstrated that it is managed by careful yet progressive executives; it has proved its earning capacity, for in addition to other acquirements it has just erected and holds to its credit a six-flat apartment house. The association receives monthly rentals of a little over $800, all of which, minus running expenses, is being applied to the retirement of construction loans now reduced to about $10,000. The Harvard Building Association affords an object-lesson and example well worthy of study and emulation. Its officers are: Wm. J. Hennessey, president; Thomas J. Gill, vice-president; Edward F. Blake, treasurer, and Frank T. Viles, secretary. Trustees: Archibald L. Stark, Jeremiah F. Scully and Harry R. Stone.

Judge Buchanan, at Jackson, Miss., says that the railroad commission of that state has a right to force the Postal or any other telegraph company to put in offices wherever they deem proper, but he cannot understand how or why a railroad company should be forced to go into the telegraph business when it doesn't want to.

The statue to be erected in Belfast, Ireland, as a memorial to the late Lord Kelvin, is to be executed by A. Bruce Joy.

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The Statement of Ohm's Law.

BY MORTON G. LLOYD.

In 1826 G. S. Ohm announced the relation between electromotive force and current, which has ever since been regarded as one of the fundamental laws of electrical science. The law discovered by Ohm is that in a definite conductor of the first class,[1] under definite conditions, the current is proportional to the electromotive force which produces it, that is, to the total electromotive force in the circuit. It was applied by him to continuous currents, but it is equally true of conductors in which alternating currents are flowing. Since it is true of the instantaneous current it must hold also for values obtained by summation over a complete cycle.

Put into the form of an equation, using the usual symbols, Ohm's law becomes $\frac{E}{I}$ = a constant. That is to say, if E be varied while all other conditions remain the same, the ratio $\frac{E}{I}$ remains constant. If some other condition, such as the temperature, be changed, I is again proportional to E, but the ratio has now a different value.

If e be the instantaneous impressed electromotive force in an alternating-current circuit, then we must combine with it the self-induced electromotive force, since Ohm's law applies to the total electromotive force. Thus $\frac{e - L\frac{di}{dt}}{i}$ = constant, where $\frac{di}{dt}$ represents the rate of change of current and L the inductance. If the circuit or conductor be coupled with a secondary circuit, there will be another component of electromotive force to be considered; thus $\frac{e - L\frac{di_1}{dt_2} - M\frac{di_2}{dt}}{i_1}$ = constant.

When we consider effective or maximum values in an alternating circuit supplied from a source of sinusoidal electromotive force, Ohm's law may still be applied if the inductance of the circuit be definite and constant (e. g., free from iron). The equation then becomes $\frac{\sqrt{E^2 - L^2p^2I^2}}{I}$ = constant, where E is the electromotive force impressed on the circuit or conductor, and LpI represents the self-induced electromotive force.

If there be capacity in the circuit, its potential forms one component of the electromotive force which must be included in the equation. Thus for instantaneous currents, $\frac{e - L\frac{di}{dt} - \frac{q}{C}}{i}$ = constant, where C is the capacity and q the charge; and for the effective values with sinusoidal currents,

$$\frac{\sqrt{E^2 - I^2\left[pL - \frac{1}{pC}\right]^2}}{I} = \text{constant.}$$

When put into this form it is evident that Ohm's law holds for alternating currents, and the idea so often expressed that this law does not hold under these conditions is seen to be due to an erroneous point of view. Just as in the case of continuous currents, the value of the constant is changed whenever the conditions are changed, and here a greater variety of conditions may exist. Thus a variation of frequency, if the latter is sufficiently high, may alter the value of the constant, and in this case the variation of L with the frequency would have to be considered also.

The form which Ohm's law takes in the case of alternating currents is not one which is convenient for computation, and it is due to this fact that the formula involving the expression for impedance has taken its place in the discussion of alternating currents. But it should be borne in mind that the law of Ohm is just as true, for the law then takes on a greater significance.

It should be noticed that up to this point the word "Resistance" has not been used, and I want particularly to lay stress upon the fact that Ohm's law can be discussed without mention of it. Resistance is the name which has been given to the ratio $\frac{E}{I}$ in the case of continuous currents, and the practical units of measurement of the three quantities, electromotive force, current and resistance, have been so chosen that the numerical relation $\frac{E}{I} = R$ holds. When a change of temperature or other condition alters the ratio $\frac{E}{I}$ we say that the resistance changes, in order to keep intact the above relation.

Having defined resistance in terms of the conditions in a continuous-current circuit, it then becomes a matter of experience (or extension of definition) as to whether the same relation holds under other conditions, as, for example, with alternating current. As a matter of fact with sinusoidal currents the radio $\frac{\sqrt{E^2 - I^2\left[pL - \frac{1}{pC}\right]^2}}{I}$ is still called the resistance, and if the value of this ratio changes with the frequency, for example, again we say that the resistance changes,

[1] i.e., metals, etc. Ohm's law does not hold in gaseous conductors.

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even though all the physical characteristics of the conductor remain unaltered.

Inasmuch as the conception of resistance is a consequence of Ohm's law, it does not seem desirable to use that term in the expression of the law, at least not in the way that it is so often stated, viz.: "The current is equal to the electromotive force divided by the resistance." The law is better stated from the logical standpoint, by saying that the current is proportional to the electromotive force, or that their ratio is a constant.—New York Electrical Review.

Use Your Spare Moments.

There is no occupation in which the employe does not have spare time; whatever the occupation, there are numerous moments that may be used for advancement. It is every one's duty to be busy. God intended it. When our usefulness is done, He will remove us. Do not idle your time away; it is a sin. The men who have won success are men who knew the value of time and made good every moment. Think of such a man as Gladstone, who carried a little book in his pocket lest he let a moment slip from his grasp. If such a man be careful of his moments, what ought we to do? Time wasters are on every side, and we should choose to do our duty every moment.

At no time in history has there been such opportunity for study as at present. There is no excuse for the man or woman who has no education. There are thousands of boys and girls, men and woman, who use their time for naught when they could be making some improvement. Business firms are searching for men and women qualified to fill positions.

It is the moment here and there that you grasp that makes you go up the ladder of success. Lincoln made use of every moment to accomplish something, and he rose to be one of the great men.

When it is necessary to rest, do so. It is not intended for us to work continually. You should not pause because you can, but because you need it. Lying around or loafing is not a necessity. If you are quiet when needs be you will do your work better and enjoy it more. The man who accomplishes things is the one who rests, studies, and reads in a manner that develops every part of manhood.

Rest is a necessity; we cannot live without it. It is what each of us must have if we expect to become men of power; but in resting there is a limit and it must not be carried to such an extent that we become lazy. The great difficulty with most young men is they waste many moments in idleness. It is not expected that you will use all your spare time in study. If you did that you would be likely to become a bore and not succeed so well. There are twenty-four hours in a day and you should divide the time so as to utilize it for advancement. If you are careful you may divide your time so that you may accomplish many things; it is not how much work you can do, but how good. Wise men have a time for all things, and it is "up to you" to do the same.—J. M. Baldwin, in "Office Appliances."

Opportunity.

"If I had a chance, my position in life would be a better one," is what one hears quite a number of men say. In some cases it is true; in others, it is not. Too many permit the chance to pass them by; or, when the chance comes their way, they find themselves poorly equipped for the chance. A young man learns how to telegraph, or how to manipulate the levers of a railroad signal tower. The years pass by and he has no knowledge of anything else, except how to work the telegraph key and read the Morse language as it is clicked from the instruments. Switchboards are a mystery to him, and if called upon to make a "cross connection" he is unable to do so. If his levers get out of order, or anything goes wrong with the mechanical signaling apparatus, he calls for a repairman and learns naught from him which might prove valuable in an emergency. Every year brings improved signaling apparatus into use, and the up-to-date leverman seeks knowledge regarding such improvements so he will become better equipped for promotion. He has a business eye on his opportunities.

The best evidence one can give to the members of our Order is: "Wake up and rise to fight and win" Post up on your work; become skillful employes. Those who have strained their muscles for years throwing old-fashioned levers, must find the time to "post up" on more approved appliances. Books are available and a few hours a day would bring results. Keep up with the procession.

No man without a "pull" can obtain promotion if he does not merit it. Seniority of service is of no value when a better position is in sight, unless one is competent to fill the position. Reliance on "pull" is insecure, because such influence is liable to be lost through death, or the "pull" losing its power. The best "pull" is what one has stored away in the brain; what the hands have been taught to do. Eating so-called brain foods for breakfast, traveling the same old daily rut and growling about promotion not coming your way, wins nothing. We cannot all become presidents of a railroad, but every man ought to try to pull himself up to a higher position. To succeed, he must know something more than his associates, because that superior knowledge lessens the number of his competitors. Be prepared to grasp "Opportunity" when it knocks at your door.—The Railroad Wire and Signal.

"Pocket Edition of Diagrams," etc., by Willis H. Jones, electrical editor of Telegraph Age, embodies more practical information concerning the telegraph than any book or series of books hitherto published. See advertisement.

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The Atlantic Cable of 1858.

BY WILLIAM MAVER, JR.

The development of transatlantic cable telegraphy was not by any means the work of a day; in fact, it had been led up to step by step, and not until many shorter seas had been successfully bridged by submarine cables was the question of a cable across the Atlantic seriously mooted. It is true that as early as 1843 Morse, as a result of experiments that he had made in telegraphing over a circuit about 80 miles in length, wrote as follows to the Hon. John C. Spencer, then Secretary of the Treasury of the United States: "The practical inference from this law is that a telegraphic communication on the electro-magnetic plan may, with certainty, be established across the Atlantic Ocean! Startling as this may now seem I am confident the time will come when this project will be realized."

This, however, was obviously nothing more than a happy prediction, for at that time no proper means of insulating wire for submarine telegraphy were at hand. Guttapercha, which nature appears to have especially provided for this purpose and without which submarine cable telegraphy would have been next to impossible, was not then known as an insulator. Indeed, specimens of guttapercha were not introduced into Great Britain until 1843, and the material did not reach the United States until 1847, where its property as an insulator for submarine cables appears to have been discovered, or at least developed, by Mr. S. T. Armstrong, of New York.

With the advent of a suitable insulator for submarine cables it was natural that attempts should be made to connect countries separated by stretches of water, by means of the electric telegraph, and within a short time after the discovery of guttapercha plans were being made to connect Great Britain and France telegraphically.

The concession for this cable was obtained from the respective governments by Mr. Jacob Brett on August 10, 1849, with the condition that the work must be completed before September 1, 1850. The cable for this purpose consisted of a No. 14 copper wire, covered with guttapercha to a thickness of about one-quarter inch. No armor or jute was placed over the cable, but to insure its remaining at rest on the bottom of the sea, lead sinkers, weighing twenty-five pounds each, were attached to the cable every one-sixteenth of a mile. In order to comply with the conditions of the concession the work of making and laying the cable was prosecuted with all possible celerity, and on August 27, 1850, just three days before the expiration of the concession, Dover, England, and Calais, France, were for the first time telegraphically united, and messages of felicitation upon the happy completion of the work were exchanged amid the joyful acclaims of the inhabitants of both countries.

But the operation of this cable was short lived, a thing not to be wondered at in view of the manner of its construction, and subsequent investigation by divers showed what now appears might have been foreseen, namely, that where the cable hung over ledges on the bottom of the sea, the chafing of the lead weights had worn away the guttapercha, exposing the bare conductor.

"It was no wonder," said a writer of the period, "that the cable was cut, it being no thicker than a lady's stay lace, while it ought to have been as thick as the cable of those placed in the Britannia tubes in position, say, eight inch or ten inch cable, and to be submerged below five fathoms, by the aid of enormous weights, so as to avoid all currents."

It is but fair to say that even the projectors of the enterprise themselves were not surprised at the unfortunate termination of the work, regarding it more in the nature of an experiment than otherwise. The results of this experiment showed conclusively that a properly constructed cable would prove successful between these points, and the energies of engineers and manufacturers were devoted promptly to designing a cable to meet the requirements. The form of cable next determined on was a four-conductor cable in which the guttapercha insulation was protected by a jute covering over which was placed an armor of galvanized iron wire. A cable constructed according to this plan was successfully laid between Dover and Calais, October 17, 1851. The length of this cable was twenty-five miles. Its total cost was $75,000. Its operation was a complete success, and in the course of a comparatively short time London and Paris were exchanging messages directly; that is, without the aid of intermediate stations.

The inauguration of the Dover-Calais cable gave incentive to the laying of numerous other submarine cables in Europe and America, with the result that before the year 1857 there were, exclusive of short cables across rivers, nearly one-thousand miles of cable in operation in those countries, the longest of which was between England and Holland, one-hundred and fifteen miles. Four hundred miles of cable had also been laid between different ports of the Black Sea during the Crimean War and by means of which the respective countries interested were kept in electrical communication with the seat of war, a great desideratum at that time.

The successful operation of these numerous but comparatively short submarine cables naturally suggested to many minds the possibility of transatlantic submarine telegraphy. There were others, however, who were fearful that the difficulties in the way were too great to be surmounted. As Dr. Lardner wrote at the time (1855): "The sanguine consider the project practicable, and its speedy realization probable. The more phlegmatic notice it only with ridicule. Men of science generally admit the possibility of a remunerative result." Others, imperfectly informed, believed that the cable would not sink below a certain depth, at which

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the increasing density of the sea water would render it, bulk for bulk, as heavy as the cable. This view, however, was erroneous for the reason, as pointed out at the time by the same writer, and as subsequent experience has shown, that water is susceptible of compression in so slight a degree that even at the greatest depths of the ocean the cable must always greatly exceed the sea water in specific weight. There were others also like Shaffner in our own country who had no faith "that a telegraphic cable laid in the ocean two thousand miles could be made available for practical telegraph purposes with the present known sciences." Shaffner doubtless had in mind the retardation of signals due to the static capacity of cables and there is no doubt that if the "known sciences" of overland telegraphy, at that time had not been improved upon in long-distance submarine telegraphy his lack of faith in that art for "practical telegraph purposes" would most likely have been justified.

Prominently, if not initially, among those who were instrumental in pushing the project of trnsatlantic telegraphy into the open, impartial history requires that the name of F. N. Gisborne, an Englishman in the telegraph service at Montreal, must be mentioned. As early as 1852, or immediately following the success of the Dover-Calais cable, he appears to have become imbued with the belief that a transatlantic cable from Newfoundland to Ireland was a possibility, and with that end in view set about to obtain the means to construct the necessary intermediate cables between New Brunswick and Prince Edward Island, thence to Newfoundland. Only partially successful in his endeavors he came to New York in the spring of 1854 to exploit his schemes and was so fortunate as to meet Cyrus W. Field at the hotel where he was stopping. In Mr. Field he found an attentive listener and from that moment began Mr. Field's historical association with the ultimately successful accomplishment of transatlantic telegraphy.

One of the first acts of Mr. Field when his attention was called to the project was to communicate with Lieutenant Maury, then director of the National Observatory of the United States, requesting his views as to the possibility of immersing a cable between the old and the new world. He also communicated with Professor Morse, soliciting his opinion as to the practicability of transmitting signals electrically over a distance equal to that separating Newfoundland and Ireland, namely, 1950 miles. To both of these inquiries affirmative replies were received, whereupon he at once undertook the organization of a company to raise the necessary funds to put the project into execution. The company, known as the New York, Newfoundland and London Telegraph Company, was organized in 1854, and was immediately successful in its efforts to raise capital, and the remarkable interest taken in the enterprise by the people and the governments of the countries and states concerned is well exemplified by the manner in which money, land, landing rights and the free use of war vessels for the laying of the cable was bestowed on the company. The government of Newfoundland, for instance, gave the cable company exclusive privileges for fifty years of landing cables on Newfoundland, Labrador and their dependencies, and it may be recalled that these privileges were invoked when the Marconi Wireless Telegraph Company recently sought to erect a wireless station in Newfoundland. The same government also guaranteed interest on the bonds of the company to the extent of $250,000, together with a grant of fifty square miles of land on the Island of Newfoundland. The governments of Prince Edward Island, of the State of Maine and likewise the governments of Great Britain and the United States, gave grants of exclusive landing privileges and subsidies of large amounts of money. The capital stock of the company, $1,750,000, was quickly subscribed for in America and Great Britain; and in a comparatively short time the contracts for the construction of the first Atlantic cable were given out, the work being divided equally between Messrs. Glass and Elliott, of London, and Messrs. R. S. Newall and Co., of Birkenhead, England. Great care was exercised in the design of this cable, every precaution being taken to avoid the defects of previous shorter cables and to provide for the severer conditions that its greater length and the greater depths of ocean in which it was to be submerged would involve. If the cable were too heavy the previous experience of John Watkins Brett with a heavily constructed cable between France and Algiers had shown that "the management of such an ocean cable would be an impossible undertaking." On the other hand, the experience with some of the earlier cables, notably the first Dover-Calais, had demonstrated that the attempt to utilize too light a cable would be useless. Hence a cable that would possess maximum strength and flexibility, combined with minimum size and weight, was designed. The conductor itself was a strand of seven No. 22 copper wires of the purest copper then obtainable. The outside diameter of the strand was one-sixteenth of an inch. This strand was covered with three coat-coatings of guttapercha to an outside diameter of three-eighths of an inch. Over this was placed a coating of thread yarn, well saturated with a mixture of pitch, tar and oil. Around this core was wound an iron armor consisting of eighteen strands of No. 22 iron wire, seven wires to a strand, or 126 wires in all.

The completed cable had a diameter of three-quarter of an inch. The weight of this cable was 1860 pounds per mile. The shore ends of the cable were protected by much heavier armor and jute, and weighed approximately seven tons per mile. In short, it may be said that this pioneer cable virtually embodied all that has been found necessary in subsequent transatlantic cables, except as to improvements in details of con-

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struction. The total length of the cable, including the shore ends, was 2535 miles, a large allowance for possible losses of cable being supplied. The cost of the cable was $1,258,250.

The cable having been completed, the portion manufactured by Messrs. Newall and Company was shipped on board the United States Ship Niagara, while the portion from the works of Glass and Elliott was placed in the hold of the British ship Agamemnon.

After many preliminary festivities in celebration of the laying of the cable, upon the successful completion of which the thoughts of two continents were hopefully turned, the expedition set forth from Valentia Bay, Ireland, on August 7, 1857, but after paying out 344 miles of cable from the Niagara, the cable parted, and the cable-laden ships despondently returned to Valentia; the unused cable was uncoiled from the holds of the Niagara and Agamemnon and for the time being operations were suspended.

Following this disaster the public mind became distrustful of the ultimate success of transatlantic telegraphy and additional capital for further operations became difficult to raise. The directors of the company, however, continued firm in the belief that success was yet possible and during the winter of 1857-58 measures for a renewal of the enterprise during the following summer were vigorously prosecuted. The governments of the United States and Great Britain courteously granted the request of the company for the further use of the Niagara and Agamemnon and these vessels were once more got in readiness for a renewal of the undertaking. In the expedition of 1857 it had been arranged that the Niagara would lay her portion of the cable from Valentia to the middle of the Atlantic where she would be met by the Agamemnon which would then proceed with her part of the cable to Trinity Bay, Newfoundland.

This time it was arranged that both vessels should proceed to the middle of the Atlantic, where they would separate after splicing the ends of the cable together, the Niagara to proceed to Newfoundland, the Agamemnon to Ireland. In accordance with this plan the vessels met in mid-ocean June 26, 1858, and commenced paying out the cable. The ill success of the previous expedition still followed, however, and after several breaks in the cable, work was abandoned on June 29 and the vessels returned to the rendezvous, Queenstown, arriving at that port July 5, 1858.

Nothing daunted, however, and in the face of countless forebodings of continued ill success by a large portion of the public and press, the directors of the enterprise once more started the telegraph fleet to their meeting place in mid-ocean on July 17, 1858. The ships met as arranged and each proceeded to its destination. This time the laying of the cable was successfully accomplished, no mishaps having occurred from the moment the ships separated until they arrived respectively in Trinity Bay and Valentia.

The public had become so discouraged by previous failures that the announcement of the successful arrival of the expedition at Newfoundland, August 5, 1858, was not immediately believed. Dispatches from Cyrus W. Field speedily convinced the most sceptical that the unexpected had happened, and the entire country gave way to rejoicings, and as a writer of that time put it: "Bells were rung, bonfires blazed, business ceased, illuminations sprang up, the press became jubilant. Rarely has there been heard so universal a shout of joy."

This it must be noted was upon the announcement of the safe arrival of the cable on the American shore. No public message had yet passed over the cable and it was not until August 16 that the long expected message from Queen Victoria to President Buchanan was received. By some oversight or delay in transmission only the first paragraph of the Queen's message was at first received and its apparent curtness caused great disappointment. This feeling was dissipated on receipt of the entire message the following morning, August 17. The Queen's message was as follows:

"The Queen desires to congratulate the President upon the successful completion of this great international work, in which the Queen has taken the deepest interest. The Queen is convinced that the President will join with her in fervently hoping that the electric cable which now connects Great Britain with the United States will prove an additional link between the nations whose friendship is founded upon their common interest and reciprocal esteem. The Queen has much pleasure in thus communicating with the President, and renewing to him her wishes for the prosperity of the United States."

The reply of President Buchanan was as follows:

"The President cordially reciprocates the congratulations of Her Majesty, the Queen, on the success of the great international enterprise accomplished by the science, skill and indomitable energy of the two countries. It is a triumph more glorious, because far more useful to mankind, than was ever won by conqueror on the field of battle. May the Atlantic telegraph, under the blessing of Heaven, prove to be a bond of perpetual peace and friendship between the kindred nations, and an instrument destined by Divine Providence to diffuse religion, civilization, liberty and law throughout the world. In this view will not all nations of Christendom spontaneously unite in the declaration that it shall be forever neutral, and that its communications shall be held sacred in passing to their places of destination, even in the midst of hostilities."

It had been predicted by the engineers of the cable company as a result of experiments which they had made that a speed of at least seven words per minute would be obtainable over the

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Atlantic cable. From the fact that the Queen's message, containing just ninety-nine words, had taken sixty-seven minutes in its transmission it is evident that seven words per minute were not realized. However, allowance must be made for the crudeness of the art and for the many disadvantages under which the engineers and operators were then laboring.

But, alas, like the first cable between Great Britain and France, this first Atlantic cable was also doomed to a very short useful existence. After the transmission of the messages to and from the Queen the signals over the cable became weaker and weaker until August 31, 1908, when they failed utterly. C. F. Varley, the electrician of the company, was sent to Valentia to ascertain the cause of the non-working of the cable. He made a number of tests and reported that a fault of great magnitude existed at a distance of about two hundred and sixty miles from Valentia. W. T. Henley, telegraph engineer, and Professor W. Thomson, also carefully tested the cable during the month of September, but without success so far as obtaining readable signals through the cable was concerned.

It has been thought, and perhaps correctly, that the injury to this cable may have been due to the employment of high-tension currents from induction coils in signaling, and the view has been expressed that had only low-tension currents been employed, their utility for this purpose having been demonstrated by Latimer Clark, the injury to the cable might have been avoided. There is, however, no proof that the fatal faults in the cable were due to these high-tension currents, and it is not difficult to imagine that the inexperience in cable making at that time, together with the more or less crude methods of paying out the cable on ship-board, may have been sufficient to account for the cause and development of the faults in question. Furthermore, it is to be remembered that at this early period of long-distance submarine working, variable earth currents practically debarred the use of very weak currents for signaling. It probably was not until Varley's interposition of the condenser in the cable circuit, thereby obviating the disturbing effects of the earth currents, that recourse could be had to weaker signaling currents.

Whatever may have been the cause of the failure of the Atlantic cable of 1858 there is no doubt that its failure confirmed the opponents of transatlantic telegraphy in their opinion as to its impracticability. So firmly were some of these opponents convinced on this point that the construction of an overland telegraph line between America and Europe via Behring Straits and Asiatic Russia was undertaken and over $3,000,000 were expended on this work before the final success of cable telegraphy was assured by the satisfactory completion and operation of the Atlantic cables of 1865 and 1866.

Since that time submarine cable laying has gone on apace until all lands and continents are now joined together by these metallic threads. In 1880 there were about 51,000 miles of cables laid and working in various parts of the world. To-day there are 250,000 nautical miles of submarine cable in operation, and if cable laying now be at a lull it is only because there are no more waters to conquer. Indeed, singular to say, submarine cable telegraphy has shown itself able to supplant overland telegraphy between points not separated by water, but where the difficulties of construction and maintenance of overland lines are practically insurmountable, as witness the electrical connection of many of the ports of South America and of the Philippines by long submarine telegraph cables.

In an impartial review of the events connected with the making and laying of the Atlantic cable of 1858, the jubilee of which is now being celebrated, as well as of the shorter submarine telegraph cables beginning with the Dover-Calais cable, it would be unfair to omit mention of the important part, one might almost say the exclusive part, borne by British telegraph engineers and cable manufacturers, among which shine out conspicuously the names of Engineers Whitehouse, Varley, Thomson (Kelvin), Brett, Bright and Henley, and the manufacturers already mentioned. Regarding Varley especially it may be questioned whether he has yet received the credit due for his important early work in this relation. —Electrical World.

Book Notices.

The "New Catechism of Electricity," by N. Hawkins, M. E., covers so wide a range in its consideration of the field of applied electricity, as to attach peculiar value and significance to the volume. Few there are, comparatively speaking, who are in a position to take advantage of the technical training afforded by special schools and the science departments of colleges and universities. The workshop must of necessity continue in large measure yet to furnish and develop the electrician of whatever grade, of the future. Such a volume as the one under consideration affords a distinct help to the student and seeker after aid in electrical matters. It is a practical treatise prepared with especial care and knowledge of the subjects presented, by an author of extended reputation and versatile information, whose numerous educational works are well known. In its treatment it includes the dynamo and motor; wiring; the electric railway; electric bell fitting; electric lamps; electric elevators; electric lighting; electric plating; the telegraph and telephone; measurements, tables, etc. The book, which is abundantly illustrated, embraces nearly 550 pages, is bound in red durable leather with gilt-edged leaves—a handsome and substantial volume. It will be sent on receipt of price, $3, to any address, carrying charges prepaid. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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The Military Telegrapher in the Civil War.

PART VIII—(Concluded)

In concluding the account of the personal experiences of William H. Woodring as a military telegrapher during the Civil War, embodied by him in a letter addressed to Colonel William R. Plum, the historian of the military telegraphers, and written from Kansas City, Mo., in October, 1878, begun in the September 16 issue, the interesting chronicle goes on to say:

"On January 9 (1863) we expected the attack on Springfield, Mo., to be renewed. General E. B. Brown, our commander, had been severely wounded. Not knowing at that time that the enemy was in retreat, and expecting another assault, we prepared for a final defense on the opposite side of the town from the point of attack by the enemy the day before. In such anticipation early in the morning I went to my office and secured all my books, together with late files of messages, destroying all others, making a bonfire of them on the hearth, determined that nothing that could possibly be the means of conveying information should by any chance fall into the hands of the rebels. Also taking with me my instruments, I hid them under the house at which I boarded, reserving only a relay and key, which, with my books, I took with me to the main fortification. I was so exhausted by this time, having had little or no respite from labor and excitement incident to the battle, for forty-eight hours, that I was compelled to seek rest, and gladly accepted an officer's tender of the use of a cot in his tent. Here I slept undisturbed through the day, until late in the afternoon, when learning that Colonel George H. Hall, who assumed command when General Brown fell, wished to send some despatches to department headquarters requesting that reinforcements be sent to our succor. I volunteered to perform this service, promising, if possible, to transmit the messages as soon as I might reach a point on the line where I could get a circuit from the east, provided that the Colonel would furnish me with a suitable escort. I was ordered to report just before dark when the despatches and escort would be ready.

"Summoning 'Bob' Bates, my repairer, as an assistant to accompany me, we got our horses ready. I strapped my relay to the saddle (for I had no pocket relay then) and after supper with the despatches in my possession, we started out under escort of a cavalcade of twenty-one men, a sergeant being in command. These soldiers, who were selected from a contingent of militia, were not seasoned veterans, and their courage was of the vapory kind, requiring numbers to sustain it when placed under trying and lonely conditions, as the sequel will show.

"On account of the wire, which had been pulled down by the rebels, being strewn along the sides of the road and across it in many places, our progress was necessarily slow and dangerous, as the horses' legs frequently became entangled in its meshes. Evidently the broken wire had purposely been placed where it would cause us the most embarrassment. After proceeding slowly and with extreme caution for a distance of ten miles, we halted at a farm house, where we waited until near morning, when the moon arose, in the light of which we resumed our journey. At a point twenty-four miles from Springfield we stopped to prepare our breakfast. Alarmed at the distance that separated them from headquarters, and with possibility of capture, for the country was as liable to be overrun by the enemy as by the Federals, the men began to express discontent and to object to proceeding further. By the time the meal was finished they had made up their minds to return, the sergeant exerting little or no authority in opposition to this mutinous decision. I was determined to press forward, however, at all hazards, as no connecting circuit had yet been found, and endeavor to accomplish the errand on which I had started. I called for volunteers to go with me. One soldier alone responded, as also did brave "Bob," my repairer. Our valiant escort turned back, and we three were left alone to face such dangers as might beset us. I determined to push forward to Lebanon, thirty-one miles distant, the nearest military post, and which my experience thus far gained led me to believe would be the nearest telegraph point from which I could send forward my messages. We examined our arms, mounted and started on our perilous trip, urging our horses into a fast pace.

"After proceeding in this manner about ten miles we came suddenly in sight of eight or ten mounted and armed men, partly uniformed in blue and partly in jeans, looking altogether very much as did the men who so lately fought against us. They were as suspicious of us as we of them, and when the command came for us to "Halt!" discretion caused an immediate compliance with the order. The strangers proved, however, to be friends, the advance guard of a large command of militia which had been sent to reinforce Springfield. We were, of course, permitted to pass and continue on our way to Lebanon, reaching that place shortly after dark. We were made welcome and heartily congratulated on our long ride and on the gratifying news we brought as the result of the battle at Springfield. We were given a fine supper, after which I hastened with my despatches to the telegraph office, transmitting them myself to department headquarters at St. Louis. The St. Louis Democrat requested me to give them the particulars of the fight, as the news had gone abroad after the wires were cut that Springfield had been captured. I also sent the sad news of Briggs' death to his bereaved family. He had a wife and two children in Delevan, Wis., to whom I subsequently forwarded all his effects. Briggs was buried before I reached Springfield, on my return, and now sleeps in the soldiers' cemetery in that city.

"The sergeant who commanded the little troop of escort, as I afterwards learned, was placed under arrest on his return to Springfield after his

cruel and cowardly act of desertion, tried by court-martial and punished by being reduced to the ranks. The shell, a shrapnel, that so unceremoniously banged into my office at Springfield, I packed up carefully and sent it as a present to Captain George H. Smith, my superintendent at St. Louis. He had the charge of powder withdrawn from it, and at the close of the war returned the trophy to me. I keep it with my war relics.

"Thunder storms were and still are of frequent occurrence at Springfield, due in great part to peculiar mountain formations. At such times the lightning would sometimes play serious pranks with the telegraph wire. At one time both of my office relays were burned. I had one experience with the lightning while in Springfield which came near 'breaking the current' of my own existence. We had just moved our main battery from one part of the building to another, and to reach it had run the main line to a pair of brackets fastened to the window sill on the second floor, this window being directly over a long flight of inside stairs. I had run the office wires to this window, and, sitting on the sill, was connecting them to the main wire, when the lightning struck the line somewhere east, giving me such a tremendous shock that it nearly threw me from my lofty seat.

"On the sixth of June, 1863, I got my second furlough, and hastened home to join my friends in Illinois. At the expiration of the thirty days to which I was entitled, I returned to Springfield, but this time was accompanied by my wife. The remainder of the year passed pleasantly away. There was not much to do. We had now little disturbance in the way of war alarms, an occasional raid our way would sometimes stir up excitement, but it was only of a temporary nature, for by this time the main armies of both sides were operating at points further to the southward. By the latter part of March, 1864, the Union forces had concentrated at Little Rock and Fort Smith, Ark., to which places we had extended our wire, reaching the former point from Memphis, Tenn., the latter from Springfield. On March 8, I was relieved at Springfield, Ewing L. Armstrong succeeding me, and ordered to Fort Smith, with directions to report first at St. Louis. My wife returned to Illinois, and I, after receiving instructions and being supplied with the latest department cipher, started for Fort Smith via Springfield, proceeding thence on my own horse and in company with a government supply train, protected by a heavy military escort. We reached Fort Smith, April 2.

"The country south of the Missouri line and between Fort Smith and Little Rock was infested by many roving bands of guerrillas, cruel and bloodthirsty, whose boast was that they took few or no prisoners. The telegraph line had been extended from Fort Smith to Little Rock, but it was interrupted much of the time by being cut. In fact, it worked only a very few days after my arrival. Repairers had to be kept moving constantly in order to restore connections. The entire section became so thickly infested by these "bushwhackers," as they were called, that it was exceedingly dangerous for repairing parties to travel along the line. Indeed, Alexander Kane, Thomas Jones and Jacob Richards, line repairers, were killed by a party of guerrillas near Clarksville, Ark., a short distance below Fort Smith, on or about April 15. Kane, or "Doc," as he was called, was the foreman, but he was a man who never thought of danger, and was exceedingly cheerful and popular on the road, over which he had made a number of trips. He had often remarked to his companions that being non-combatants, the enemy would not attack them, and that it was useless to have troops to accompany them. When, finally, they were attacked they were without military escort, unarmed, and all were cut down in cold blood, their bodies being horribly mutilated, Kane's ears being severed from his head.

"After this event and until late in the fall of 1864, this line of telegraph was entirely abandoned, it being deemed altogether too hazardous a matter to attempt to keep it open. In August our situation became quite critical; only partial communication was maintained with department headquarters at Little Rock; the enemy was concentrating around us and frequently attacking our outposts. It became necessary to send information to Little Rock of our condition. General Thayer wrote his despatch and had me rewrite it in the department cipher for him. He then sent two trusty soldiers dressed in citizens clothes with it to Little Rock. They avoided the public highway during this journey, traveling through the brush most of the distance. One of the incidents happening on the way, according to their report, was that while tramping along one day, following the line of the telegraph, in company with another citizen whom they happened to meet and to whom they represented themselves as being 'Secesh,' they remarked on the dilapidated condition of the telegraph wires, when their companion boastingly mentioned having helped to kill the three repairers some time before. The two disguised soldiers seized the self-confessed culprit and forthwith hung him to a pole with a piece of the broken wire and left hanging there with a card pinned to his coat stating the reason why he was thus strung up.

"My assistant at Fort Smith was Joseph L. Sears, a good operator, while James Lane and J. K. Bear were my repairers. At Van Buren, four miles distant, Joseph Hansen was the operator. On September 1, being ordered to report at St. Louis in company with Mr. Sears and Mr. Lane, I left the office at Fort Smith in charge of Mr. Bear, who was only a fairly good operator. At St. Louis I was given the military wire to Cincinnati, which I continued to work until October 7, when Major Eckert, at Washington, asked Captain R. C. Clowry (then our superintendent) for the temporary loan of four good operators. In response to this request Captain Clowry sent on Charles H. Mixer, Joseph L. Sears, John W. Gregg and myself. I was given a letter of introduction to

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Major Eckert, who assigned me to duty in the War Department, Mixer being sent to Jamestown Island in the James River, Va., and the other two to City Point, near Petersburg. After remaining in Washington one week I, too, was ordered to City Point. On reaching Fortress Monroe, however, a despatch was received directing me to remain there, as another man was greatly needed at that point, it being a repeating station between City Point and Washington.

"Our telegraph lines leading toward the former place had been frequently tapped by the enemy, and it became very annoying to our army commanders, that their messages were so frequently made public in the enemy's camp. Accordingly Major Eckert had a cable laid up the James River from Jamestown Island to Fort Powhattan, twenty-two miles distant, thus opening a safe line of communication, at least from the depredations of the enemy, over the worst infested portion of the route. At the same time the land line was kept up, for the sake of appearances. The gunboats and monitors frequently anchored in the river and occasionally hooked up the cable; sometimes even breaking it during windy weather by dragging their anchors. George D. Sheldon, the assistant superintendent, sent me up the river about two weeks after my arrival, in charge of a repair boat, to test for a break made under these circumstances, a task I successfully accomplished.

"At the expiration of the six weeks for which we were wanted by Major Eckert, the four of us returned to St. Louis, reaching that city November 21, 1864. Reporting to Captain Clowry, I obtained permission to proceed to Springfield, Ill., there to be mustered out of the military service, after having served the government three years and a half. My regiment had been mustered out six months previous, but by reason of the scarcity of operators and the dangers and distance to travel, I was not relieved, and could not join my regiment when it was discharged, and its members received their final pay and bounty."

The injustice with which the military telegraphers have been treated by the government from the time of the war to the present day is fittingly set forth by Mr. Woodring's closing words, written thirty years ago, evidently with much feeling, laboring under a sense of wrong and injustice inflicted, then comparatively fresh in his mind. He says:

"In closing this sketch permit me to make a statement concerning the very unjust way in which the government treated the detailed military operator in the Department of the Missouri. The great wrong inflicted I did not fully realize until I presented myself at the State Department at Springfield, Ill., for the bounty, which the government had offered to its soldiers, and which other detailed men, including clerks, hospital stewards, etc., were permitted to draw without question. I was coldly told there was nothing due me. This decision was based on an order which, for some reason unknown to me, was issued by the Secretary of War in October, 1863, at a time after I had served two and a half years, to the effect that soldiers detailed as operators should be given an indefinite furlough from their regiment, without pay or emolument, yet permitting them to receive an operator's salary, the same as citizen operators. This order was not sent to me until some time after its issue, and when it did come was not understood in its full sense. The loss of my month's pay as a soldier was right enough, for I was drawing a monthly salary through another source, but to be deprived of the bounty which the government offered as a premium, not as a reward, to those who enlisted in the army, was a wrong which it was hard to endure, a wrong which I think the government should, even at this late day, rectify. I have tried through three different solicitors to obtain the bounty, but each time my papers were returned with the endorsement: 'Nothing due this soldier from United States for pay; bounty not allowed by decision of Colonel Gibson, chief of division.'

"The salary paid by the government to its operators was hardly commensurate with the duties performed. The position of a military operator was of vast importance. He necessarily became acquainted with all the movements or intended movements of the armies, were necessarily entrusted with the secrets of the government and its armies, yet the pay was no better than that of an ordinary clerk. I hope that others better qualified for the task may take up this subject and present it in its proper light, that the reading public may know how poorly this great republic has compensated its military telegraph operators and what a debt it owes them."

Notwithstanding the fact that Telegraph Age keeps a standing announcement on the editorial page that it furnishes cable codes through its book department, as well as the further information of like character disseminated through the medium of catalogues issued by us and scattered broadcast by the thousands throughout the telegraph service and elsewhere, we are frequently in receipt of letters from managers, receiving clerks and others, requesting to know where certain cable codes are to be obtained. Why, from the office of this paper, of course, from which codes of all kinds and descriptions have been supplied for years in response to a never-ending demand. Let us emphasize this statement and further say that Telegraph Age is headquarters for everything in the telegraph and cable line in the shape of literature and educational matter. Our friends and the public generally may write us, confident in the thought that any telegraph cipher code, not out of print, and all electrical books of whatever nature, telegraph and otherwise, can be purchased here. They will be sent on receipt of price to any address.

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The Storage Battery in Signal Service.

BY H. M. BECK.

In the operations and care of a storage battery there are four points which are absolutely vital to its success, and if they are not properly handled, trouble will surely come sooner or later: First, the battery must be charged properly; second, the battery must not be discharged too low; third, short circuits between the plates must be prevented; fourth, the plates must be kept covered with electrolyte and only water of the proper purity used for replacing the evaporation. Never use acid for this purpose.

The proper charge is one of the most important and least commonly understood, and it is the purpose of this article to give some hints as to the proper methods to be employed under ordinary operating conditions, and the reasons for the same.

In charging there are two ends in view: First, to restore the charge to the battery after a discharge has been taken out, so that it is ready for another discharge. These charges are known as regular or service charges; second, to keep the battery in good condition and obtain the maximum life out of the plates. Such charges are called overcharges.

Possibly if ideal conditions could be counted upon, these two types of charges could be combined into one, but under practical conditions experience has shown that it is better to separate them. The service charges are then planned on a very efficient basis; in fact, the charge is cut off slightly before the cells are full in order to allow some leeway for irregularities without danger of continually overcharging, and the overcharges, given only at intervals of one or two weeks, are carried far enough to even up the different cells and reduce sulphate which may have formed, thus keeping the cells in good condition. It is easily seen that as a battery consists of individual cells, each working as an independent unit, and since the efficiencies of these units vary to a slight extent, it is necessary to even up the cells at intervals, or they will become very irregular and get into bad condition. It is common practice to overcharge once a week where a battery is charged every day, and once in two weeks where it is charged less often, including those cases where it is not discharged at all. In other words, it is well to overcharge at least once in two weeks whether the battery has done any work during this interval or not.

Where practical it is well to charge at about the normal rate. Lower rates take longer and the indications of the end of charge are not nearly so marked, so that there is greater danger of charging too long or cutting off too soon. Higher rates require closer watching and if allowed to continue after the cells begin to gas, they mechanically wash out the active material and thus decrease the capacity and life of the plates. There is also greater danger of heating in warm weather. Where it is desired to hurry a charge on account of limited time, the current rate should be increased during the early part of the charge and before the cells begin to gas, and during this period rates considerably above normal can be used with comparatively little injury, although this depends somewhat upon the type of the plates used. A safe rule is to limit the maximum charging rate to forty per cent. above the normal. From the gassing point on it is well to keep the rate at normal or below.

The temperature of a battery will not usually show any dangerous increase during charge except in the case of sealed cells or where the battery room is very hot and ventilation poor. It should, however, be watched, where there is any question, and never allowed to exceed 110 degrees. If it shows a tendency to do so, decrease the charging rate or stop entirely and allow periods of rest for cooling. High temperatures, while they temporarily increase the capacity of a battery, eventually decrease its efficiency and life.

A storage battery gives three indications which are in common use for determining the proper point at which to cut off a charge: First, the rate in voltage; second, the rise in specific gravity; third, the appearance of gassing.

Rise in Voltage.—The voltage during charge gradually increases until the cells are fully charged, when it ceases rising and will not rise any higher, no matter how long the charge is continued. This final voltage is generally termed the "maximum," but it must be clearly understood that it has no fixed value, the actual figure varying widely at different times, depending upon the age of the battery, the temperature of the electrolyte and the charging rate.

Rise in Gravity.—During discharge, acid from the electrolyte goes into the plates and the specific gravity readings fall. During charge the reverse process goes on, the acid is driven out of the plates, and the specific gravity readings rise. When all of the acid has been driven out of the plates, however, the specific gravity cannot rise any higher, no matter how long the charge is continued, and the cell is fully charged. This final specific gravity is called the maximum and like the maximum voltage, is a variable figure, depending upon the temperature of the electrolyte as well as upon the actual proportion of acid and water present in the cell.

Gassing.—Until nearly charged, the plates of a storage battery should absorb the energy put into them with little or no gassing, but when they are nearly charged the energy, instead of being "stored," shows itself in the form of more or less violent gassing, the amount depending upon the rate of charge.

To experienced battery men the color of the plates also serves as a guide for charging, but this is used rather as a check on the charging methods than for the governing individual charges, and in fact it would not be adapted to the latter pur-

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pose, as the change in the color of the plates from charge to discharge is too slight in a normal battery.

Of these indications the first two, voltage and gravity, are those most commonly employed in operating. Gassing, while frequently of great assistance as a guide or warning, cannot be depended upon for accurate results and is only used where nothing but the most crude methods of operation are practical.

Either voltage or gravity readings alone could be used, but as both have advantages in certain directions and disadvantages in others, it is advisable to use each for the purpose to which it is best fitted, the one serving as a check on the other.

Voltage has the great disadvantage that it is dependent upon the rate of current flowing, and for this reason where it is used the charging rate must be kept at a fixed value. Open circuit readings are of no value, as a cell then reads almost the same discharged as it does charged. On the other hand, a voltmeter is a very easy instrument to read and where desirable can be placed at a distance from the battery.

A hydrometer reading is almost independent of the current flowing, so that it is not necessary to keep the charging rate fixed, but the instrument is harder to read than a voltmeter, the readings are not as sensitive, and, at least with the present apparatus, the readings have to be taken at the battery. The fact, however, that the hydrometer reading is largely independent of the current rate is bringing it more and more into use where gravity readings are practical, the voltage then being used only as a guide or check.

As already explained, during the early part of a charge, the cells should show practically no action, and during this period they need comparatively little attention except to see that they do not heat. When gassing begins, however, it is an evidence that the end of the charge is drawing near, as the plates are not absorbing all of the current and this is showing itself in the form of gas. The gravity or voltage should then be watched closely in order to detect the proper cutting off point. Where the battery is accessible and it is practical to get accurate gravity readings, it is preferable to use these for determining the end of charge, the voltage simply serving as a check. Where the cells are small at a distance, or sealed so that gravity readings cannot be obtained, then it is necessary to depend on the voltage, and in this case the current rate must be kept accurately fixed during the latter part of the charge. This is not of so great importance when the gravity method is used and constitutes one of its great advantages.

On overcharges it is well to begin reading and recording the gravity or voltage every fifteen minutes from the time the gassing begins. The charge is then continued until five of these readings are alike or show no further rise, if it is intended to charge to a one-hour maximum, the most common practice. It should be especially noted that no mention of any given voltage or gravity limit has been made. The point is not to charge to any given voltage or gravity, but to charge until the voltage or gravity will not rise any higher, no matter what actual figures are reached. These will vary widely at different times, due chiefly to the age of the battery, the charging rate or temperature changes, and it is thus evident that charging to any fixed figure, as, for instance, 2.50 volts, is almost sure to result in too much or too little charge, and cannot produce the best results. The writer has seen cells which could not be charged above 2.40 under some conditions, while under others it was necessary to bring them up to 3.00 volts to get them fully charged. It is thus evident that it is a great mistake to attempt to cut off at any fixed figure.

In some classes of service it is not practical to charge as often as once in two weeks, and in such cases all charges become overcharges. In fact, they should be continued longer than ordinary overcharges in order to make sure that all the cells are brought to a maximum. For instance, where there is only one charge a month, it is advisable to continue the charge to a four or five-hour instead of a one-hour maximum.

The question is sometimes asked as to why it is necessary to charge beyond the maximum point, for instance, to a one-hour maximum, which means charging for one hour after the maximum gravity or voltage is actually reached. This is necessary for two reasons, first, because, we have no means of determining when the maximum is reached except by charging further and seeing that there is no further rise and, second, because, as already explained, an important function of overcharges is to even up the various cells in a battery and to this end it is necessary to run long enough to bring up not only the most efficient cells, but also any which may have dropped behind since the preceding overcharge. Thus the longer the intervals between overcharges, the greater the variation between the cells is likely to be, and the longer the overcharges should be carried.

The maximum gravity or voltage determined by the overcharges serves as a standard for cutting off the regular charges, the idea being that for a period of one or at most two weeks it is safe to use a fixed figure in cutting off, especially when this figure allows some little leeway. The general principle is thus to use a fixed standard for short periods and to have the overcharge maximum automatically change this standard, as the conditions change, especially temperature. When the temperature variations are very great, it is sometimes advisable to correct for them, but this is not usually necessary.

The common practice is to cut off service charges when the gravity has reached a point from three to five points below the preceding overcharge maximum, or when the voltage is from .05 to .10 volts per cell below the maximum.

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In using the gravity method of cutting off charges, it is necessary to have a pilot cell; that is, one cell on which readings are taken to represent the rest. Readings might be taken on all of the cells, but this would entail a great deal more labor and experience has shown that it is not necessary. Where a battery is either charged or discharged in more than one series a pilot cell should be selected in each series, as the different series are likely to work differently, and thus need separate watching. As the specific gravity readings vary not only with the charge and discharge but also with the temperature and amount of water in the cell, it is necessary to take some precautions in order to obtain accurate results. It is not usually necessary to allow for temperature changes between overcharges, but if necessary this is not a difficult operation. The temperature of the electrolyte is taken with a thermometer, a floating dairy thermometer being a good type, and one point is added to the specific gravity readings obtained for every three degrees above 70° or one point subtracted for every three degrees below 70° F. This corrects the readings to a standard of 70°, that is, gives the reading which would have been obtained at this temperature, the other conditions being the same.

Variation in the height of the electrolyte and consequently the amount of water in the pilot cell, is obviated by adding water to the pilot cell so often that only a slight amount is put in at any one time and consequently the readings not affected. To accomplish this end, a convenient height for the electrolyte should be marked and then sufficient water added to the cell each day to keep the level accurately at this mark. It will be found that only a slight amount of water is thus added at a time. In the case of glass jar batteries, a line of paint on the outside constitutes a convenient mark and it should be clearly understood that unless the height of the electrolyte is kept accurately fixed, the pilot cell readings are of little value and may be very misleading.

The gravity method of determining the end of charge has become so important that apparatus has been developed to meet its special requirements and thus assist in rendering the operation more accurate. To obviate irregularity due to temperature changes, there is now a compensating hydrometer which automatically corrects for temperature so that this factor does not have to be considered. To keep the height of the electrolyte at a fixed point, there is an automatic cell filler which adds water to the cell in direct proportion to the evaporation, the only attention required being to occasionally fill the small reservoir. Such refinements are, of course, not always practical, but there is unquestionably a large field where they are well worth while and will pay for themselves many times over.

From what has been said it will be seen that if thoroughly understood, the proper charging of a battery is not a difficult matter, although the fact that fixed gravity or voltage limits cannot be given, makes it somewhat more complicated than we could wish. It is probably this fact, the variable final gravity and voltage readings, more than any other, which has caused so much trouble.

With storage batteries as with other apparatus, the conditions cannot always be made to conform to the methods which would give the best results, looked at purely from a storage battery standpoint, and in such cases, the methods have to be modified to meet the conditions at the expense of the life of the plates. Such conditions must be met as far as possible by special operating methods, but fortunately they are rather the exception than the rule, and the present day battery has shown itself capable of giving splendid results even under extremely trying conditions.—The Signal Engineer.

A Unique Telegraph Line.

In Bolivia between the City of La Paz, the capital, and the town of Oruro, the terminus of the railway connecting it with the seaport of Antofagasta, there still may be seen the remains of what was probably the most original telegraph line ever erected, says the London Electrical Review.

In this part of Bolivia there are no growing trees, and wood is so difficult to procure that even the ordinary household furniture of the native is invariably made, not of wood, but of dried mud, or adobe, as it is called. It is, therefore, not surprising that when the war broke out in 1880 between Chile and Bolivia, and the need for a telegraph line between the two places mentioned became urgent, that, as all communication with any seaport was cut off, this material was used to construct pillars to take the place of ordinary posts for supporting the wire, with the addition of old bottles as insulators.

These pillars were substantially built on stone foundations, and measured about five feet square at the base, with a height of about fifteen feet. They were placed at intervals of about one hundred and ten meters, and thus held the wire at a height sufficient to clear the only animals of the country, the llama and the donkey. The total length of the line was one hundred and fifty-six miles, and it rendered useful service for some ten years before being replaced by the ordinary wooden telegraph pole line.

Among other curious telegraph lines may be mentioned the growing pole line erected in Uganda by an ingenious English engineer, who, unable to find any dead wood which would withstand the white ants, hit on the idea of transporting growing bark cloth trees to the side of the roads and using them as poles. This system has been in use some ten years with success. In the Dutch East Indies trees are also made use of for a similar purpose, but here a wire is stretched across the road between trees on either side, and the insulator is suspended in its middle, and the line is thus over the road and clear from vegetation.

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The New Models of the Remington Typewriter.

Announcement is made of the appearance of new models of the Remington typewriter. These are known as Nos. 10 and 11. It may be said of them that they are not new in name only, nor are they new only in that they combine principles new to the Remington. They might, in fact, be called advanced typewriters, for they offer many features of merit new to every user of the writing machine. The new models are front-stroke machines. They possess all of the excellent features of typewriter construction which have always been associated with the Remington name, including the solid drop-forged type bars and the broad pivot bearings, new features in front-stroke construction but which have always been vital factors in the durability and reliability of the Remington typewriter.

The five-key column selector, as expressed in this device, is an entirely new feature in typewriter construction. It is distinctly a time and labor saver. The characteristic feature of the column selector is that it will "jump" columns. This device is built into the machine of which it forms an integral part. It consists of five keys placed immediately back of the upper row of type keys on the keyboard, thus enabling the carriage to be brought instantly to any one of five writing points on the scale. A reversible rack at the back of the machine permits the "setting up" of four different sets of stops, thus in reality providing for twenty stops to the line, a sufficient number for every conceivable kind of work.

The column selector is in no way intended to supersede or take the place of the Remington decimal tabulator, for that mechanism appears in the new model, but with increased convenience of operation and efficiency in results.

Another new feature observed in these new models is the escapement or letter-spacing mechanism. This is a great improvement of the wheel escapement. Instead of the single wheel with adjustable dogs heretofore used this new escapement has two wheels and a single dog, the latter permanently adjusted in the machine. Any operator by the manipulation of three small screws can set the wheels of the new escapement to a regular, reverse or off-set spacing, with any variations of these general spacings which may be desired. Such a feature will be welcomed by operators everywhere. Then there is a black spacer on the new Remington which enables the operator to return the carriage space by space, depressing a key. There is also a new lock for the variable line spacer so that when the right thumb wheel is pushed in, disengaging the teeth of the ratchet from the cylinder, the ratchet may be permanently locked out of contact until released by a touch of the finger.

Paper guides of great strength, which adjust themselves automatically to any thickness of paper, a two-color ribbon device which also permits a transverse use of the entire surface of the ribbon where one-color ribbons are used, front marginal stops which are simple and convenient, a new paper side guide, a new shift lock, and two carriage release levers which render it equally convenient to release the carriage either with the right or the left hand, are some of the other notable improvements of these new models.

Old Time Telegraphers' and Historical Association.

Elgin G. Saylor, of Pittsburg, Pa., superintendent of the Western Union Telegraph Company at that point, who was elected president of the Old Time Telegraphers' and Historical Association at its late meeting held at Niagara Falls, has appointed the following-named to membership in the executive committee: J. G. Splane, Robert Pitcairn and George A. Cellar, of Pittsburg; Daniel Colestock, of Titusville, Pa., and Belvidere Brooks, of New York. The holdover members are: Harvey D. Reynolds, of Buffalo; J. C. Barclay and C. C. Adams, of New York, and U. J. Fry, of Milwaukee, a total of nine members.

The following report of the treasurer shows the financial standing of the Old Time Telegraphers' and Historical Association:

Balance on hand September 1, 1907....	$781.28
Received as dues	676.00
Received as initiation fees.....	12.00
Received as interest	15.76
	$1,485.04
Total expenses	$694.77
Sept. 1, 1908—Balance on hand.....	$790.27

Examined and found correct.

M. J. O'LEARY, Auditor.

New York, September 1, 1908.

To the Members of the Old Time Telegraphers' and Historical Association.

GENTLEMEN:—Your secretary begs to report that at the beginning of the fiscal year there were 1,395 members. During the year, six new members were enrolled. So far as known, fifteen have been reported dead, eight have resigned, fifty-six have been dropped from the roll for non-payment of dues, leaving a net membership of 1,322.

The names of the dead are: Herbert M. Arnold, John Brant, George H. Corse, William A. Case, Albert Ford, Ernest Jennett, J. W. Kates, Charles Matthias, V. H. MacCord, George F. Randolph, George E. Stuart, M.D., Charles A. Stancliff, G. F. Thompson, James Ware, M.D., and W. H. Young.

We desire to state that back numbers of this paper, those issued more than one month prior to any current date, will be charged for at the rate of twenty-five cents apiece when they can be furnished. This price is fixed because of the necessarily limited stock we carry, and of the difficulty we sometimes have in filling an order. Oftentimes the request is for papers of a more or less remote date, with the expectancy of being charged at but ten cents a copy, whereas in order to obtain the desired issue we are ourselves frequently obliged to pay the larger sum, or even more. The growing value of complete files of Telegraph Age should cause our readers to carefully preserve their issues.

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KERITE

INSULATED WIRES AND CABLES

KERITE insulation is a homogeneous combination of crude Kerite with the finest Para rubber. Kerite preserves the rubber and has unequalled life and durability. This has been *proved* by the actual test of fifty years.

¶ Initial tests determine if an insulated wire will do the work for which it is intended; *but* initial tests can *not* determine if it will do that work years hence. Kerite has back of it an unequalled record of half a century of successful service under the most adverse conditions.

¶ Kerite insulation does not deteriorate, but improves with age.

KERITE wires and cables installed half a century ago are in service to-day. The wonderful durability of Kerite insures the highest efficiency, safety and economy, and is a guarantee of the best and most successful results.

¶ The property of Kerite in resisting deteriorating influences and the qualities which render it so indestructible are facts which should be carefully considered where an insulated wire is used.

¶ Take advantage of the experience of others and insure your service with Kerite.

For Fifty Years the Standard of Excellence

AERIAL—UNDERGROUND—SUBMARINE

W. R. BRIXEY

SOLE MANUFACTURER

Hudson Terminal, 30 Church St., New York

Western Representative: WATSON INSULATED WIRE CO., Railway Exchange, CHICAGO, ILL.

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The Railroad.

Following the action of the state of Arkansas, recorded in our issue of October 1, the Supreme Court of the State of Wisconsin has declared unconstitutional the Wisconsin eight-hour railroad telegraphers' law, which was enacted at the 1907 session of the legislature. The law is declared unconstitutional on the theory that it is in conflict with federal enactment.

The annual meeting of the Railway Signal Association was held at the Willard Hotel, Washington, D. C., October 13, 14 and 15. The principal subjects considered were as follows: Tuesday, electric interlocking; mechanical interlocking; storage battery. Wednesday, committee No. 1, signaling practice, and sub-committee of No. 1, standard design; automatic stops and cab signals; subjects and definitions. Thursday, automatic block signals; rubber-covered wire; manual block signals; election of officers.

The special committee appointed to report on rubber-covered wire, has been painstaking, arriving at results of much value. It commends kerite, although not providing a specification or test for it. In the memorandum of the association of manufactures, the following appears: "Inasmuch as wires insulated with kerite have been in use for fifty years, and have proved their merit, we suggest that a special specification be made for them, in which the mechanical and electrical requirements be the same as called for by general specifications." The committee's comment is as follows: "The committee concurs, with the exception that it does not desire to present a specification for this compound."

In addition to the two despatchers' telephone circuits, already mentioned in this column, the Delaware, Lackawanna and Western Railroad Company has just completed and put in operation a similar train despatcher's telephone circuit, between Binghamton and Buffalo, a distance of 203 miles, with forty-five stations and equipped with Gill selectors. This is up to the present time the longest circuit, with the largest number of stations in one circuit which has been put in operation by the Lackawanna system. The transmission, according to the statement of Mr. L. B. Foley, the superintendent of telegraph of this road, is entirely satisfactory, and enables the despatcher to handle his work very much quicker than was done with the telegraph.

Mr. J. A. Norris, of Chicago, a veteran lineman in the service of the Chicago and North Western Railway Company, was retired on a pension on October 1, after more than forty-two years of faithful service. Mr. Norris reached his seventieth year on August 5, for he was born in 1838 at Leesburg, Ind. Going to Texas when a young man, Mr. Norris had a war record on the Confederate side. After the conclusion of hostilities, coming North, he had a short experience in the telegraph service, that of the Illinois-Mississippi Valley company, during which, however, he was concerned in laying the first submarine cable across the Mississippi River at Keokuk, Iowa, in 1865. He also made the first change from the old wooden insulators to the glass insulators that was made in that section of the country. In April, 1866, he entered the employ of the North Western company, and from July of that year until the present time, he had charge of the lines of the Galena Division. He was a faithful servitor, and throughout that long period never lost a day's time, and has retired honored and respected by his company.

The annual convention of the Association of Railway Telegraph Superintendents, held at Montreal, Que., on June 24, 25 and 26, the twenty-seventh in the series, was a memorable one, particularly so as the important question of train despatching by telephone rather than by telegraph, engaged a large share of the attention and time of the members present. The verbatim report of the meeting has been carefully compiled and published in substantial pamphlet form by the secretary and treasurer of the association, Mr. P. W. Drew, of Chicago. It furnishes a volume of over 170 pages, and embraces an amount of interesting matter of value not alone to the superintendents who were there and who thems lves took an active part in the meeting, joining in the discussions in which many debatable questions were argued, but also to the telegraph operators and despatchers in the railway service, whose duties therein were searchingly analyzed, and many others whose business closely allies them to the railroads. The papers read on the occasion were of a timely nature and mainly considered questions just now appealing with peculiar force to numerous phases of practice observable in the railroad situation, considered from an operating and telegraphic point of view. In the discussions that followed the several questions thus treated keen interest was manifested and an immense amount of information elucidated. All this is fully set forth in the volume, the plan of publication following careful and sequential order in arrangement, pleasing to the reader and seeker after knowledge. Mr. Drew, as usual, has done his work well, and it may readily be imagined why it is that his associates return him so regularly year after year to the position he has so long occupied of secretary and treasurer.

The annual election of the Philadelphia, Reading and Pottsville Telegraph Company was held at the office of C. M. Lewis, October 5, at Reading, Pa., and resulted as follows: President, Geo. F. Baer; treasurer, H. E. Paisley; secretary, W. R. Taylor; directors, Joseph S. Harris, Theo. Voorhees, Samuel Dixon and B. H. Bail. The judges were C. M. Lewis and L. D. Shearer.

China having negotiated a loan of $25,000,000, a reserve of twenty per cent. of this amount has been set apart, a portion of which is intended to be used for the nationalization of the telegraphs.

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The Magnetic Club.

The annual dinner of the Magnetic Club will take place, as has been previously announced, at the Hotel St. Denis, New York, on the evening of November 18, when, in accordance with precedent, telegraphers visiting New York as delegates to the annual meeting of the Telegraphers' Mutual Benefit Association, will be invited to be present. The fact that this affair will celebrate the twentieth anniversary of the club, invests the occasion with more than ordinary interest, and a large company is likely to be in attendance to share in the hospitalities of its generous board.

During the twenty years of its existence the Magnetic Club has been the foremost—in fact, it may be said about the only social club of the telegraph in the metropolis. It has served the laudable purpose of promoting acquaintance and maintaining a state of good fellowship in telegraph ranks, officials and members of the working staff alike meeting at these dinner events on common and delightful grounds of social equality. It has also served as a model for clubs of like character organized elsewhere. At its banquets in the past many persons distinguished in the history of the telegraph have assembled. Wit and wisdom have found gracious expression in the oratory that has followed gastronomic feats. These dinners have been the scene of good cheer. It is no wonder that the approaching anniversary awakens many thoughts in retrospection of events and of those who took part in them, crowding the memory of twenty years.

On the evening of April 4, 1888, about thirty well-known telegraphers met at dinner at a well-known restaurant on Sixth avenue, New York. Such men as T. C. Martin, Minor M. Davis, Charles P. Bruch, Gardner Irving, W. H. Baker, J. B. Taltavall, J. M. Moffatt, E. T. Barberie, Alonzo Beatty, R. G. Stephenson, Tom O'Reilly, C. L. Chase, W. Betzel, J. H. Montgomery, D. W. McAneeny, D. B. Mitchell, W. L. Ives, T. A. Brooks, John Brant, E. F. Howell, Hugh A. Moody, Lant S. Jones, George W. Walcott and W. G. Magowan, were present. The affair proved to be most enjoyable, and as telegraphers only were in attendance, thus giving to the meeting a sort of professional exclusiveness, the idea was there generated that resulted in the formation of the Magnetic Club. This was accomplished about two weeks later at a meeting called for the purpose and held in the Western Union Building on April 19, 1888, when Charles P. Bruch was elected temporary chairman and George F. Fagan as temporary secretary. The desirability of effecting a permanent organization of a social character among telegraphers was a pointed one and met with instant favor. The result was that the Magnetic Club had its birth. A constitution and by-laws were adopted, likewise a badge made in the form of a permanent (horseshoe) magnet with the symbolic figures "73" appearing between its forks. The charter membership numbered fifty-one, the limit being fixed at one hundred. At an adjourned meeting, held a few days later, namely, on April 26, officers and members of a governing committee were elected. These were: Charles P. Bruch, president; William J. Dealy, Gardner Irving, William L. Ives and Lant S. Jones, vice-presidents; George F. Fagan, secretary, and John Brant, treasurer; governing committee: J. B. Taltavall, D. W. McAneeny, J. M. Moffatt and W. H. Baker, to serve for two years; E. F. Howell, E. F. Cummings, Conrad Meyer and T. A. Brooks, to serve for one year.

Included in the list of original membership, besides those already named, were the following: F. W. Baldwin, George W. Logan, A. F. Hurd, M. J. O'Leary, T. W. Greene, Theodore Betzel, W. B. Waycott, S. A. Coleman, T. B. Fullom, J. L. Edwards, H. I. Jolly, A. F. Lauer, F. D. Murphy, T. J. Smith, George F. Baker, F. O. Nourse, W. H. Jackson, T. P. Scully, W. J. Johnston, T. M. Brennan and Harry A. Du Souchet.

Thus was the Magnetic Club inaugurated. Its subsequent history has been a record of success; its dinners have been welcomed events within fraternity circles. The hospitalities of the club, always generously extended, have been accepted by many, and during the years such men haye sat down to its festive board as W. D. Baldwin, John Bottomly, A. R. Brewer, Professor F. X. Carmody, Colonel A. B. Chandler, Thomas F. Clark, Colonel R. C. Clowry, Charles A. Coffin, Hon. P. V. De Graw, Thomas A. Edison, H. D. Estabrook, Frederick P. Fish, S. S. Garwood, Judge J. W. Goff, Dr. Norvin Green, W. C. Humstone, E. A. Leslie, Hon. Julius M. Mayer, William Maver, Jr., T. Commerford Martin, John C. Barclay, James Merrihew, Colonel J. R. McIntosh, Patrick F. Murphy, Ralph W. Pope, Hon. J. D. Reid, Charles Selden, Frank R. Shattuck, Melville E. Stone, Joseph W. Stover, Charles A. Tinker, J. B. Van Every, J. R. Van Wormer, George G. Ward, besides many others, numbered among the official staffs of the Western Union and Postal telegraph companies, the New York Telephone Company and of the New York and New Jersey Telephone Company.

Of the notable dinners held by the club, four perhaps stand out with greater distinctness than others. Of these that given in honor of Colonel Robert C. Clowry, president and general manager of the Western Union Telegraph Company, drew together the largest number of telegraphers ever assembled on a like occasion in the annals of the club to pay respect to a telegrapher. The second dinner event of most note was that given to Alexander Graham Bell. A large gathering was present, augmented by the attendance of the officials of the American Telephone and Telegraph Company, and of its local subsidiary companies, the New York Telephone Company and the New York and New Jersey Telephone Company. The banquet tendered to Thomas A. Edison, the greatest inventor of the age, himself a former telegrapher, drew a very large and representative number of people, and should be placed third on the list. The fourth may be referred to as the dinner given in honor of the officers of the West-

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tern Union Telegraph Company. At this unique affair company distinctions were rendered conspicuous, the Western Union executives occupying seats at the head of the table and wearing boutonnieres of white carnations, while the Postal officials, seated opposite, were designated by pink carnations.

The club has had as presidents; Charles P. Bruch, William J. Dealy, Edward C. Cockey, William H. Baker, E. H. Johnson, R. J. Hutchinson, Francis W. Jones, Colonel A. B. Chandler, the present incumbent being George H. Usher. Mr. Usher is supported by Marston R. Cockey, B. M. Downs, D. W. McAneeny and Theodore L. Cuyler, Jr., respectively first, second, third and fourth vice-presidents; J. J. Cardona, treasurer, and William H. Mathews, secretary.

The New Office Boy.

BY J. P. WILLIAMS.

It was in a telegraph office in Philadelphia way back in the early seventies that the following incident took place. The working force consisted of a manager, an operator and two boys. Competition between the rival companies was very keen and the nine wires, which dropped from a ponderous pole in front of the office, bore the signboards, "New York," "Washington," "Cleveland," "Chicago," "San Francisco," "Mexico," etc., though in truth these same wires had their termination, with one or two exceptions, in the central office some few blocks distant. The switchboard, into which these wires were led, was a large, clumsy affair, very imposing with many green cords and plugs.

Promptly at 9 o'clock Manager Weston appeared at the entrance to the office, alert and business-like in manner and wearing a "plug" hat, an ornament much affected by telegraph office managers of those days. He paused a moment to interrogate a small freckle-faced, red-headed lad, who for the past half hour had been glancing furtively at the placard reading "Boy Wanted," which hung from the gas fixture in the window. Evidently the boy's answers pleased the manager, for the first business of the day was to place the youngster, James Dawson, on the pay-roll.

Mr. Weston spent the next quarter hour lecturing his chief operator, Robert Green, on the uncleanly condition of the office, particularly the accumulated dust on the switchboard, suggesting that he could spend the early hours of the morning in cleaning up. To all this Jimmie was a most attentive listener and secretly resolved to win the good will of his new employer.

At 8.11 o'clock on the following morning the chief operator strolled leisurely down the street toward the office. He paused a moment on the threshold and saw a sight that lingered in his memory for many, many years. There was James Dawson, aged twelve, mounted on a chair, scrubbing brush in hand, a bucket of water and a bar of soap nearby, working like a beaver. The switchboard was already drenched in soapsuds, which ran down the floor in streams. Every wire in the switchboard was completely crossed and, of course, the apparatus was useless. It required a new switchboard and the united efforts of six wiremen to get the office in shape for business by noon. Jimmie secured a situation in a tea-importing house next day.

The New York Electrical Show.

The New York Electrical Show, held at Madison Square Garden, New York, October 3-14, commemorative of the jubilee of the first Atlantic cable of 1858, and twenty-five years of Edison electric lighting service on Manhattan Island, was a notable affair. Its interest was heightened by a speech of Thomas A. Edison, delivered through the medium of an Edison business phonograph, into which it had been dictated. This was as follows:

> Those of us who began our labors at the operator's key fifty years ago have been permitted to see and assist in the whole modern industrial development of electricity. Since the remarkable experiments of Morse in 1844 and the unsuccessful efforts of Field in 1858, there have come with incredible rapidity one electrical art after another, so that in practically every respect civilization has been revolutionized. It is still too early to stand outside these events and pronounce final judgment on their lasting value, but we may surely entertain the belief that the last half of the nineteenth century was as distinct in its electrical inventions and results as the first was in relation to steam.
>
> The lesson of the jubilee of the Atlantic cable of 1858 is one of encouragement to all who would add to the resources of our race and extend our control over the forces of nature. Never was failure more complete, never was higher courage shown, never was triumph more brilliant than that which since 1866 has kept the Old World moored alongside the New by pulsating cables of steel and copper—the "family ties" of the civilized world.
>
> When I look around at the resources of the electrical field to-day as shown in this exhibition, I feel that I would be glad to begin again my work as an electrician and inventor; and we veterans can only urge upon our successors, the younger followers of Franklin and of Kelvin, to realize the measure of their opportunities and to rise to the height of their responsibilities in this Day of Electricity.

The collection of specimens of various Atlantic cables, models of cable ships, etc., were especially attractive, and instructive in the lesson conveyed in showing the advances that have been made in the art of submarine telegraphy and cable-laying since the early days. Included in this display, the exhibit made by the Commercial Cable Company excited much favorable comment.

The famous gun-cap battery, by which signals were sent through the Atlantic Cable from Heart's Content, N. F., to Valentia, Ireland, in 1866, the property of Henry H. Ward, now a resident of East Orange, N. J., a forty-niner of the telegraph, was also shown.

Watching the hands of a clock go 'round makes a long day of it.

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LETTERS FROM OUR AGENTS.

LOS ANGELES, CAL., POSTAL.

Charles L. Lewis, superintendent, recently made an inspection of the San Diego, Cal., office as well as offices at other points within his districts.

The local Postal operators certainly have many reasons for self-congratulation. In the first place, it is a privilege to live in Southern California. No one who has not enjoyed that pleasure can imagine its many advantages over less favored regions. This company has provided at this point one of the finest operating rooms in the country. It is modern in every respect, and is justly a cause of pride and satisfaction to those members of the fraternity fortunate enough to be located here.

Then it may be said that the local officials are courteous gentlemen. Superintendent Lewis, who is also acting as manager, is well known for his genial manner. He is consistently kind and considerate to all. No more efficient chief operator could be found than V. V. Stevenson. He understands the telegraph business thoroughly and is not ashamed to admit that he likes it. As a result of his careful management the daily business of the operating room moves like a well-oiled machine, without noise or friction. F. H. Merrill is night chief, and is the friend of everybody; and Walter Ogden, late night chief, is a man well liked by all.

The Chicago bonus wire is looked after by Messrs Page and Cahoe, while Messrs Terry and Anderson attend to the San Francisco wire, and Carl Jensen the Denver phantoplex.

It will no doubt be of interest to the Old Timers to know that we have in our midst the liveliest one in captivity in the person of S. L. Griffin. He is one of the "Pilgrim Fathers," so to speak, of the business. He is still in the harness, too. Mr. Griffin was born at Delaware, O., December 24, 1482 (or it might have been 1842) and entered the telegraph service March 15, 1857. When the war broke out he went to the front. After undergoing experiences sufficient, if recounted, to fill several books, he wound up in New York, where it is said all the bad ones go. For seventeen years he was chief operator of the eastern section under A. S. Brown and A. S. Downer, after which he resigned to act as the private secretary of Thomas A. Edison. Three years later business called him West, and to his great joy he found himself in Los Angeles. Being a wise man he gave the return portion of his ticket away and took permanent root here.

A recent caller at this office was Moody Rosenquist, Postal manager at Pasadena, the popular winter resort near here.

J. H. Dorsey, of this office, is the local representative of Telegraph Age.

R. B. Chamberlain, formerly of the Sioux City division of the Chicago and Northwestern Railway Company, is now manager of the branch office in the delightful section of this city known as Highland Park.

Miss Margaret Sperling, of this office, returned October 1 from an extended vacation of two months, which took her to various points in Arizona and to Santa Barbara, Cal.

NEW YORK, WESTERN UNION.

The friends of D. W. McAneeny, and their name is legion, will rejoice to know that he has returned to duty greatly improved in health.

Miss Lulu Brannin, daughter of Traffic Chief Edward E. Brannin, was married, October 10. She was the recipient of a number of handsome gifts presented by Mr. Brannin's associate chiefs.

Mr. Con. A. Meyer, eastern division chief, is absent on vacation.

Mr. W. G. Phillips, who has been employed in this office for the past year, has returned to Lake Charles, La., to accept a broker position.

NEW YORK, POSTAL.

Extensive improvements are being made throughout the operating room. Tables have been rearranged so as to meet certain demands. New switchboards are being installed and the office has the appearance of housecleaning time. The eastern division is now at the Broadway end of the room, the western and southern divisions are on the Murray street side, and the city is where the eastern division was formerly located. Many of the improvements which have been inaugurated are a direct help to the staff. Every one seems pleased with the new restaurant, previously described, where good meals are served at reasonable prices. The men's waiting room, as has been the case with that devoted to the ladies, is also going to be a great comfort. It is well furnished and there operators can read, smoke and enjoy freedom while waiting to report for duty. It is well lighted by three windows and is also provided with electric lights. The men's coat room is now on the same floor as the operating room.

Night Manager D. F. Mallen and Wire Chief F. E. McKiernan recently returned from a trip to Pittsburg and Buffalo, where they went on a tour of inspection.

Miss Winifred Crawford is on a vacation.

Messrs. Keegan, Bauman and Driscoll are on the all-night force.

A large waiting list is in readiness to handle the election bulletins.

Some of those who compose the night force are D. F. Mallen, manager; Charles J. McCarthy, assistant night manager; Harold Dobbs, traffic chief; John Mearns, city chief; Jesse Ewing, eastern wire chief, and E. A. Coney, wire chief. Colonel Taylor looks after the annunciator board.

The Postal is represented nights at the newspaper offices, as follows Herald, F. C. Frace, J. F. Ellis and Harry Funk; Times, E. A. Byron and R. S. Crosskill; World, F. J. O'Meara and Harry Lieber; Journal, M. L. St. John and C. B. O'Rourke; Press, J. P. Williams; Sun, H. H. Bonney and E. F. Murray; Tribune, George W.

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McGill; Pike News, M. J. Pike and L. Meloche, and the Hearst News, Thomas P. Monaghan.

Day newspapers assignments are: Harry Linder, Herald; Robert C. Mitchell, Hearst News; J. B. Havice, the United Press Association; George Wichmann, World; John Quill, Sun; Mr. Schieber, Journal, and Mr. Wetterauer, Evening Post.

Mr. F. F. Norton is the day manager, with Mr. J. J. Whalen, assistant; S. C. Dodd is traffic chief; F. E. McKiernan, wire chief; C. B. Obst, city chief; Phil. Reiley, assistant city chief, and Joe Kreager, eastern traffic chief. Thomas Smith looks after the Rowland system with circuits to Chicago, Boston and Philadelphia. John H. Twyford is the western traffic chief.

A number of operators in this office are now stockholders in the Mackay Companies.

Mr. C. W. Harmon, manager of the 45 Broadway office, located in the financial district, is absent on sick leave, and is spending a month at Mount Clemens, Mich., for the benefit of his health.

Annual Meeting of the Telegraphers' Mutual Benefit Association.

The regular annual meeting of the Telegraphers' Mutual Benefit Association of New York, will be held at 195 Broadway, on Wednesday, November 18. The affairs of this sterling association, which are in excellent shape, have been conducted through the rather trying period of the last year, due to the prevailing business depression, with a wise and prudent conservatism, gaining for M. J. O'Leary, the managing secretary, many expressions of confidence in his ability from his associates and others interested—a confidence that has also found expression through courtesies shown and kind offices bestowed on the part of both telegraph companies, tenders highly appreciated by the recipient. An instance of this was shown specifically in the case of the Postal company which furnished through the office of the general manager extensive lists of the names of employes resident in all parts of the country, obtained through the agency of general and district superintendents, a valuable contribution materially facilitating purposes of canvassing.

George B. Gaines, of Richmond Va., a former telegraph operator, whose recent death was recorded in the October 1 issue of Telegraph Age, evidently realized the importance of membership in the Telegraphers' Mutual Benefit Association, for the records show that he became such when less than thirteen and one-half years of age, July 27, 1868.

Mr. A. A. Patterson, of the Western Union Telegraph Company, Toledo, O., who acts as agent for Telegraph Age at that point, and who has sent in a number of new subscriptions lately, takes occasion to remark in a recent letter that somehow the recent advance in price has acted as a means of calling special attention to the paper; has had a stimulating effect, its excellencies, as he says, apparently gaining readier recognition, when gauged by cost, even though the figure be a higher one. Be this as it may, we are gaining subscribers, not only at Toledo, but elsewhere, at $2, where before the rate of $1.50 did not always prove an acceptable charge. Possibly the even amount is what tells—so easy to handle, you know. Yet, after all, is not the paper well worth the sum demanded? If everybody in the telegraph service would make the question a test case, the problem would be speedily solved.

Mr. F. E. Patrick, who has had charge of the Barclay department of the Western Union Telegraph Company, at St. Louis, Mo., has resigned in order to devote his entire time to the management of his six-hundred-acre stock farm, situated at Olvey, Boone County, Ark.

Telegraph Age as a Telegraphic Newspaper.

The amount of matter that has been furnished readers of Telegraph Age thus far during 1908 exceeds that of any preceding period of like extent. The record up to the present time is 125 pages ahead of 1907, an advance likely to be increased to 300 by the close of the year, while the probable total number at that date will approximate 1,000 pages. These are phenomenal figures and are largely exclusive of the advertising and cover pages. While they serve in their very abundance to emphasize the thought and labor that has been devoted to making Telegraph Age what it is, they also give evidence of the expanding degree of the great field of telegraphy in its various phases of application. Yet to the average reader, unfamiliar with newspaper work with its multitudinous details, although insistent in demanding a complete telegraphic newspaper, it is doubtful if more than a dim conception exists of the care and close scrutiny that must be exercised in governing every statement published, especially in all that pertains to technical utterance. While a greater latitude of expression is permitted in the daily and non-technical press, a paper like Telegraph Age would speedily lose its prestige as an authoritative journal of the telegraph were it to lower in any manner its necessarily high standard of being accurate in all that it publishes.

Such a medium of telegraphic news and information is surely worth to any one interested the modest charge of $2, the price of subscription. Our agents and friends everywhere are urged to press the claims of Telegraph Age on the attention of possible subscribers. With returning prosperity and because of manifest evidences of the intrinsic worth of the paper to every telegrapher, at least, in this broad land, we confidently anticipate a large gain in circulation during the coming year.

Copper wire thieves are at work in the vicinity of Cleveland, O., much to the annoyance of the telegraph, telephone and trolley systems.

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United States Military Telegraph Corps Life Membership.

At the twenty-seventh annual reunion of the Society of the United States Military Telegraph Corps, held at Niagara Falls, N. Y., September 16, a resolution was adopted providing for life membership, upon the payment by any regular member of the sum of fifty dollars. Thomas T. Eckert, Jr., the youngest son of General Eckert, was the first to file his application for life membership. The application has been duly approved as of October 3. The secretary of the society, D. H. Bates, has ordered new certificates engraved for this class of membership and hopes to find use for a number of them.

Blanks are being sent out to members by Secretary Bates with a view to obtaining signatures to a petition to be delivered to Congress through the medium of Senators and Congressmen, appealing for recognition and to the placing of the military telegraphers on the pension list of the United States in common with the soldier.

Mr. Thomas A. Davin, for the past twenty-five years identified with a stock brokerage house in Boston, and who is a member of the Society of the United States Military Telegraph Corps, and well known throughout the country, is again able to resume work after a severe illness lasting two months.

The working of telegraph wires was seriously disturbed on the evening of September 29, particularly in the West and Canadian Northwest, due to the unusually brilliant display of the aurora borealis, charging the atmosphere abnormally with electricity.

Obituary.

Walter J. Crews, until within a recent date manager of the Postal Telegraph-Cable Company, at Raleigh, N. C., died on September 23.

William C. Dudley, a wealthy retired broker and former telegraph operator, died suddenly at Cincinnati, O., September 23, of heart disease, aged forty-four years.

Milford L. Fancher, aged seventy-eight years, died at Lansingburgh, N. Y., September 29. Mr. Fancher was appointed manager of the first Western Union office opened at that point, a position he continued to hold for twenty-five years.

Joseph H. Wheat, aged sixty-five years, a veteran telegraph operator at Cumberland, Md., and a member of the Grand Army of the Republic, as well as of the United States Military Telegraph Corps, died on October 4.

George M. Ferry, aged fifty-one years, general yard master of the Pennsylvania Railroad, at Duquesne, Pa., died on September 30. He was a native of Pennsylvania and had spent his entire business career in and around Pittsburg in the employ of the Pennsylvania Railroad Company, advancing from the position of telegraph operator to the place he occupied at the time of his death. A picture and sketch of Mr. Ferry appeared in the issue of Telegraph Age for October 16, 1906.

The Serial Building Loan and Savings Institution, 195 Broadway, New York, long-tried, safe in plan, economical in method and satisfactory in results, solicits the accounts of telegraphers, city or country, paying five per cent. on deposits. The soundness of this institution is certified to by the New York state bank examiner, who also commends its careful system of doing business.

Advertising will be accepted to appear in this column at the rate of twenty-five cents a line, estimating eight words to the line.

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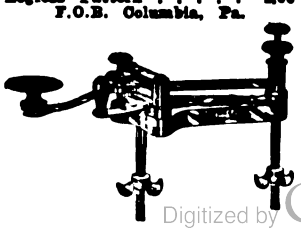

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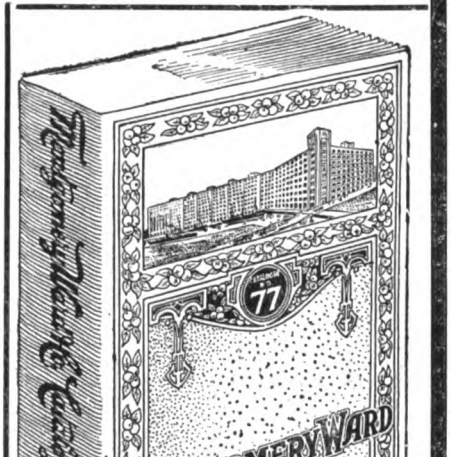

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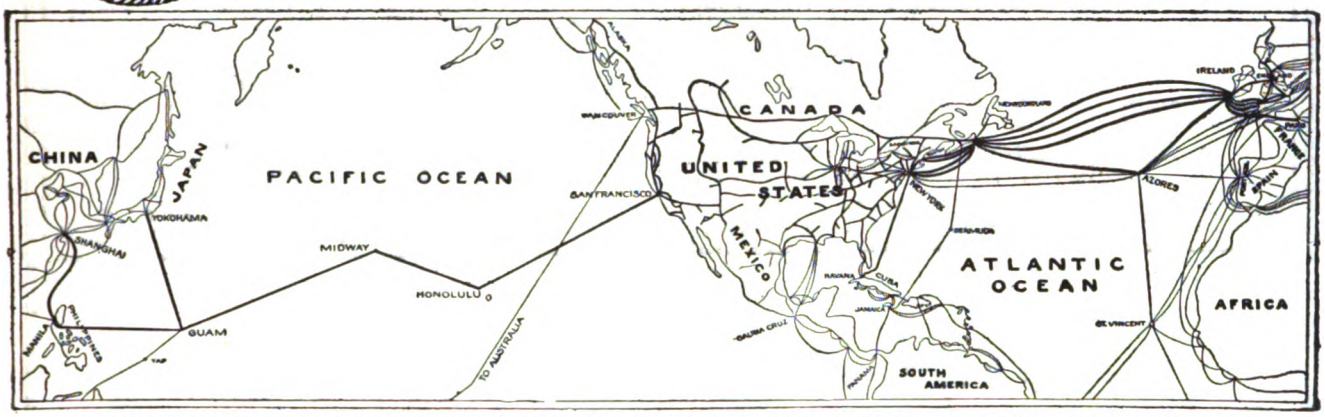

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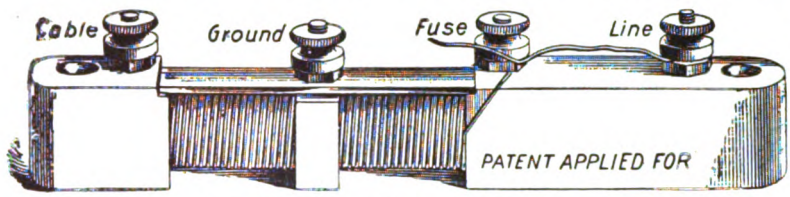

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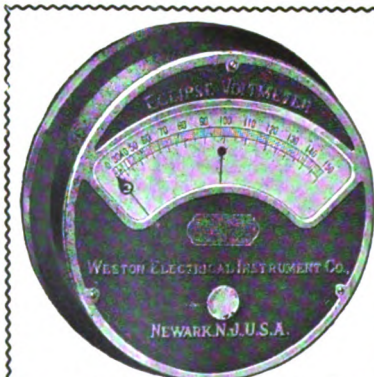

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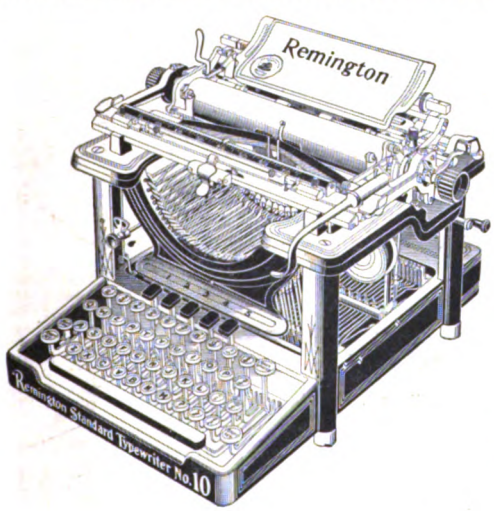

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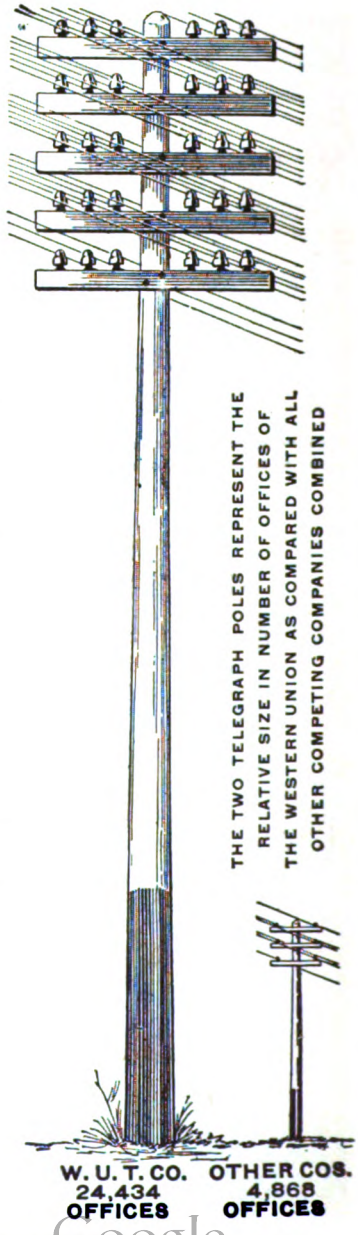

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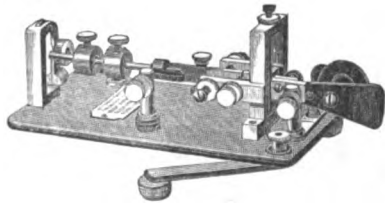

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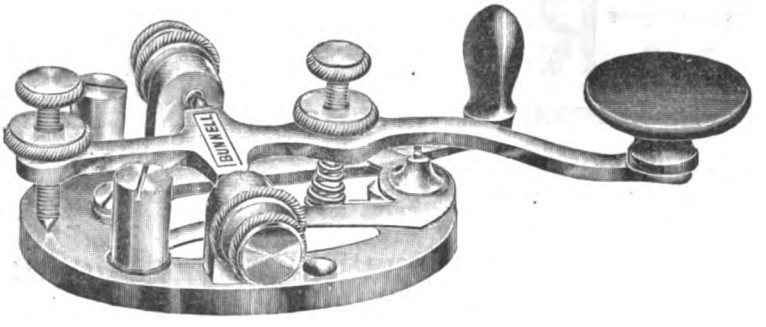

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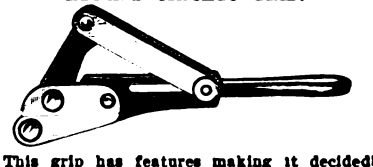

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Elementary Lessons Concerning the Operation of Repeaters.

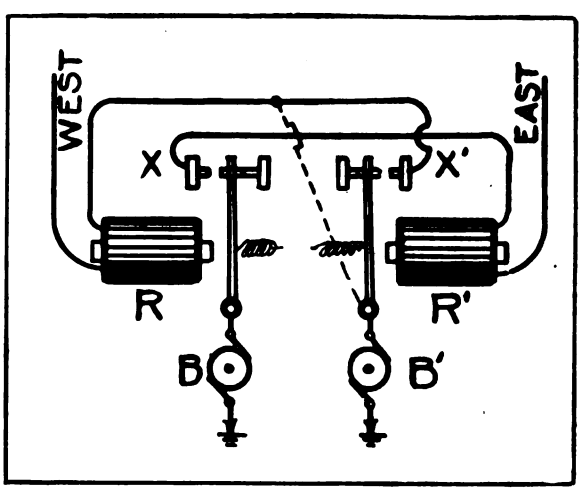
The younger members of the telegraphic profession during the early stages of their pursuit of electrical knowledge are undoubtedly retarded in making progress by failing to first seek out that particular part in a piece of electrical apparatus upon which the operation of the latter chiefly depends.

As a rule it will be found that this identical part performs the same kind of work in nearly every type of apparatus constructed for a similar purpose, but the manner in which it is compelled to do so depends upon the particular method the inventor of a given type employs in placing it in harness. Hence, a correct initial guiding knowledge of the principle involved in the operation should be sought first of all. Thus, in the study of repeater operation, a subject suggested for the benefit of students, the importance of following this policy will be readily recognized.

As it is not the purpose of this article to explain the complete operation of repeaters, only such parts of the connections of a full set are shown in the diagrams as is necessary to display the distinguishing features of different standard types in general use to-day.

Of course, the student understands that the object of a repeater is to simultaneously repeat into a companion circuit by mechanical means the identical letters or characters that are being transmitted on some other wire. This is accomplished by utilizing the lever of a relay or other magnet in the capacity of a key which opens and closes the companion circuit at its contact points through which latter the second wire is connected.

The simplest form of a repeater is obviously that of an ordinary main line relay and sounder. The lever of the relay acts as a key in the sounder circuit and, of course, duplicates all characters made in the main-line circuit. If we substitute a long telegraph circuit for the ordinary local sounder circuit, as shown in the accompanying diagram, the relay lever will still act as a repeater and operate the long circuit just the



same as it did the shorter one. Hence, the first step in the connections of a repeater is to run the second wire through the contact points of the relay or a transmitter controlled by the relay, as is usually the case, which belongs to the first circuit; and, vice versa, run the first wire through the points of the relay that belongs to the second circuit, as shown in the diagram. In this way each relay is in a position to operate the companion circuit by means of its lever, provided a means is furnished for maintaining the sending circuit intact through the repeating apparatus itself. That is to say, provided the contact points of the relay in the circuit being repeated into can be prevented from opening the sender's wire and thus permanently disconnecting the latter's battery.

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In all types of repeaters it is absolutely necessary that the repeating relay in the circuit receiving the duplicate signals shall not act as a repeater through the mere operation of opening and closing the sending wire, and yet be able to do so when any one on the receiving wire wishes to break or send into the first circuit. A glance at the diagram will show why provision against double or simultaneous relay action is required.

For example: If, without such provision, an operator on the eastern circuit should open his key, relay R at the repeating station would open relay R^1 also, and as the sender's battery is reached through the contact points of relay R^1, he could not close his own wire again because that circuit would remain open at X^1, the contact points of relay R^1. At that same time, the other wire would also remain open at contact point X of relay R because the sender could not close the latter.

One of the first methods of getting around this difficulty was devised by Wood, in what is called Wood's button repeater. His scheme was to construct an extra path around the contact points of the relay in the receiving circuit similar in effect to that shown by the dotted lines, so that whether that relay lever is open or closed the sender in the companion circuit will find his circuit closed through the repeating station at all times. Of course, the receiver's repeater relay, R^1, must not be so shunted when he breaks or wishes to send, hence a means of shifting the shunt (dotted line route) was necessary. This feat is accomplished by means of a switch lever, not shown in the diagram. When turned to the right the repeating points of one relay is shunted and when placed to the left the companion relay is in turn likewise rendered harmless.

The weak point in repeaters of this type is that they require the constant presence of an attendant to watch for "breaks," and to turn the switch every time an operator on the second wire wishes to break, after which he must again reverse the position before the sender can resume. The switch and its actual connections for shunting the contact points are purposely omitted in this diagram with the object of simplicity. The dotted line illustrates the method employed and discloses the principle involved in the construction of the earliest of pioneer repeaters. The actual connections of a full set may be found in almost every standard work on telegraph engineering.

In actual practice the levers of the main-line relays are not now used as the direct repeating device. The latter is usually the tongue of a transmitter in a local circuit controlled by the said relay. Of course, the operation is the same as if accomplished by the relay lever alone, but the transmitter tongue method is more efficient because, being in a strong local circuit, the magnet is not subject to alterations in the strength of its energizing current, as is the case with the main-line relay. In the absence of any other means of repeating from one circuit into another, the Wood repeater was considered a great invention, but the necessity of an attendant soon set others to work devising methods for doing his work automatically. The manner in which the difficulty was surmounted will be shown in the next installment of this article.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 900,238, for a telegraph key, has been granted to James Z. Tucker and Lawrence V. Tucker, of St. Louis, Mo. Patentee has a circuit-closing lever on the telegraph key, spring impelled into circuit-closing relation, and is constantly in position to open the circuit by the hand of the operator during the transmission of signals.

A patent, No. 900,553, for a telegraphic relay, has been issued to Isidor Kitsee, of Philadelphia. Has two series of selenium cells, and electromagnetic means for each of said series to place in the circuit a selenium cell of normal resistance after the lowering of the resistance of a neighboring cell.

A patent, No. 901,012, for an electric battery, has been awarded to Isidor Kitsee, of Philadelphia. The method of depolarizing an electrode provided with a catalytic substance, which consists in impinging a jet of fluid thereon when out of contact with the electrolyte, whereby oxygen is imparted to said electrode.

The following patents have expired:

Patent No. 460,572, for a printing telegraph, held by M. G. Farmer, of Eliot, Me.

Patent No. 460,619, for a steno-telegraphic apparatus, held by A. Wood, of Philadelphia, Pa.

Patent No. 460,771, for a telegraph block system of railway-traffic control, held by D. C. Coombes, Lewisham, and W. Rowe, of Marrickville, New South Wales.

A Miniature Telegraph Sounder.

We have received from J. H. Bunnell and Company (Inc.), 20 Park place, New York, a miniature telegraph sounder, weighing just one ounce. This little instrument, which is but two inches in length by one in breadth, and which is wound to five ohms' resistance, is a perfect piece of mechanism, produced with all the beauty and nicety of finish for which this house is so justly noted. The Bunnell people propose utilizing these little sounders in a practical way, mounting them in a small rubber case with head band and cords for use as a secret sounder, or for employment in noisy places where even a resonator does not thoroughly fill the bill, and to this end the company invite correspondence.

Every telegrapher who loves his profession, who is determined to master its technicalities, and thus insure for himself the confidence and respect of his official superiors and place himself in the direct line of promotion, should subscribe for and become a careful reader of Telegraph Age.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part X.)

THE REPEATING APPARATUS.

In any system of automatic telegraphy requiring the use of electro-magnetic recording apparatus, the speed of signaling is limited by the mechanical and electrical inertia of the apparatus itself, and is more or less affected by the resistance and electro-static capacity of the conducting wire, as well as by inductive interference from neighboring wires.

The duration of battery contact at a high rate of speed is necessarily short, and the current developed is small to begin with; but its strength is still further reduced by the electro-static capacity of the wire, which absorbs or accumulates upon its surface a portion of the current that would otherwise reach the receiving apparatus. The amount of current thus absorbed depends upon the length and surface of the conductor, as well as upon its proximity to the ground and other conductors; but by far the greatest detriment from this particular cause is felt from the presence of underground cables in the circuit.

The inductive interference from adjacent wires likewise increases with the length of the circuit, the tendency of such interference being to mutilate the signals, especially during the busy hours of the day. This inductive action as well as that arising from static condensation is greatly modified by dividing a long line into sections and introducing repeaters in the circuit. The repeating apparatus plays a very important part in the attainment and maintenance of high speeds over long automatic circuits, and considerable care and attention to matters of detail are necessary in the design, construction and adjustment of its various parts to adapt them to the exacting requirements of fast working.

In Fig. 29, which is a theoretical representation of the essential parts and connections of the automatic duplex repeater, it will be seen that the main-line relays R and R¹ are so arranged as to combine the functions of both receiver and transmitter; or, in other words, the currents which enter their coils from the terminal stations are directly translated by those instruments into the opposite lines without the interposition of local apparatus as ordinarily employed for effecting such purposes.

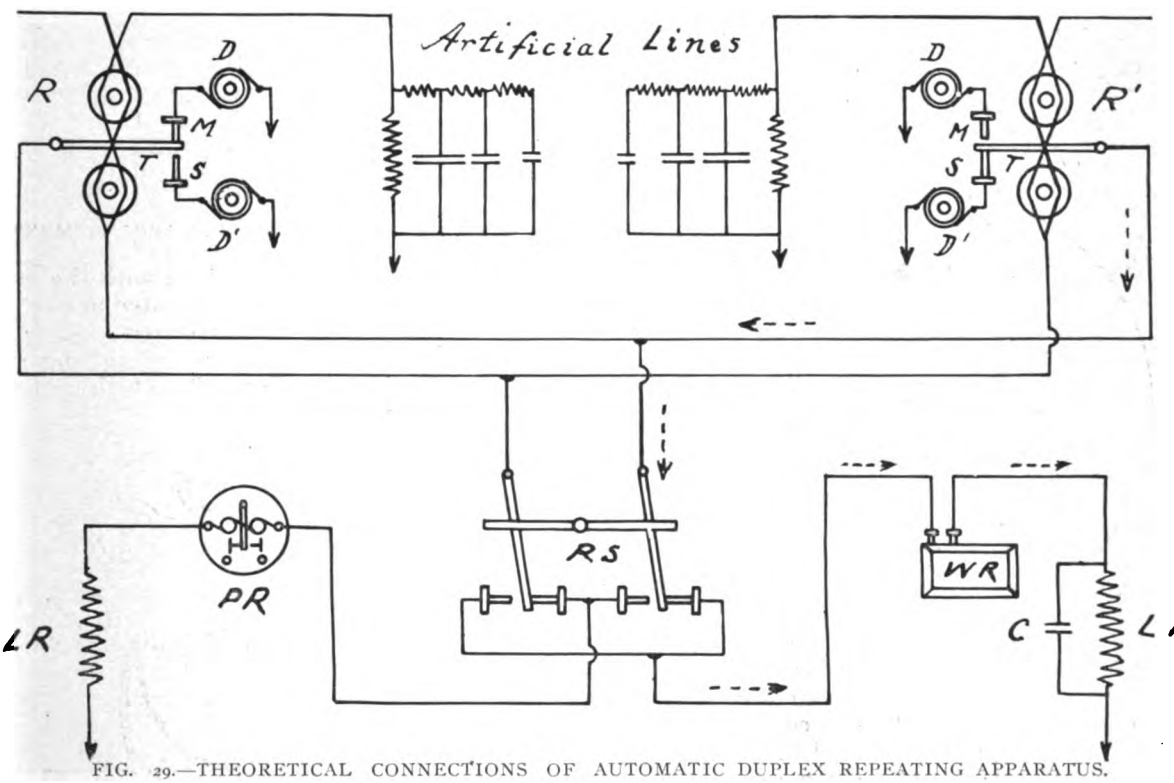

FIG. 29.—THEORETICAL CONNECTIONS OF AUTOMATIC DUPLEX REPEATING APPARATUS.

The method of accomplishing this will be readily understood from the drawing. The coils of R and R¹ are multiple wound and differentialized, as shown in Fig. 30, and are joined to the main and artificial lines in the customary way for duplex working.

Now, when the series of rapid reversals or alternating currents enter the relay coils from the distant transmitting apparatus, they start the armature tongues T (Fig. 29) vibrating between the contact stops connected with the repeating dynamos, from which the marking (M) and spacing (S) currents flow out into the opposite lines. A small portion of the outgoing current is diverted from each of the main lines into a separate leak or derived circuit of high resistance a Wheatstone receiver, WR, being placed in one.

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and a polarized relay, PR, in the other of these branch circuits. The particular object of this device is to enable the attendant, by means of the reversing arrangement, RS, to switch the recording instrument, WR, into one or the other of the branch circuits, and to thus determine how the currents leaving the repeater pass into either of the main lines. In this way a single receiver is made available for both sections of the circuit, while the polar relay, PR, which actuates a local sounder, and which interchanges positions with that of the receiver upon the reversal of the switch, serves the purpose of directing attention to irregularities, calls and other occurrences on the particular section of line in which it happens to be placed.

The amount of resistance in the leaks LR and LR¹ is never less than 5,000 ohms, and is normally maintained at about 25,000 ohms, with the view of draining off as little as possible of the main-line current. To increase the magnet-

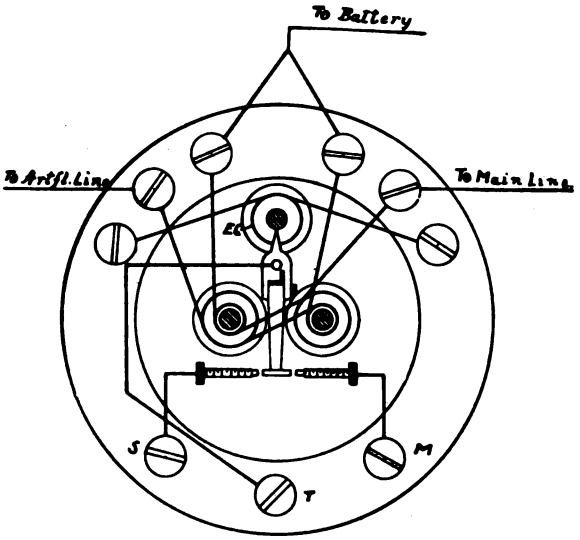

FIG. 30.—MULTIPLE WINDING AND CONNECTIONS.

izing effect of this small leakage current (whose course through one of the leak circuits is indicated by the direction of the dotted arrows) the "leak" receiver is specially wound to about 1,200 ohms, which provides a sufficient number of convolutions or ampere turns to properly actuate the instrument.

As the rate of working in practice is generally regulated at the repeater office, and is more or less determined by the condition of the signals as noted upon the leak receiver, WR, it will be evident that the latter should be adjusted to record the passing signals at the highest speed attainable, since any defect that would lower its efficiency below that of the terminal apparatus would be apt to reduce the carrying capacity of the circuit. When from retardation, deterioration, or other causes, the leak instrument fails to come up to the required standard, a condenser C, of small capacity, placed around the leak resistance, LR¹, in the manner shown in Fig. 29, will generally remedy the defect.

The instrument of primary importance in connection with the repeater set is the main line relay, portions of which are shown in Figs. 30, 31 and 32. The main and artificial coils are each

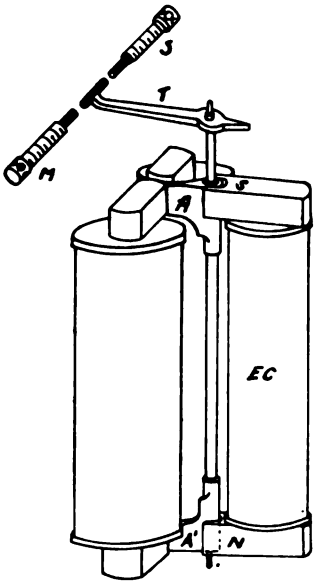

FIG. 31.—SIDE VIEW, SHOWING COIL ARRANGEMENTS.

wound to a resistance of 150 ohms with the multiple arrangement of winding illustrated in Fig. 30.

Polarity is induced in the armatures A, A¹ (Fig. 31) of the relay by means of an energizing coil EC (Figs. 30 and 31) through which a local

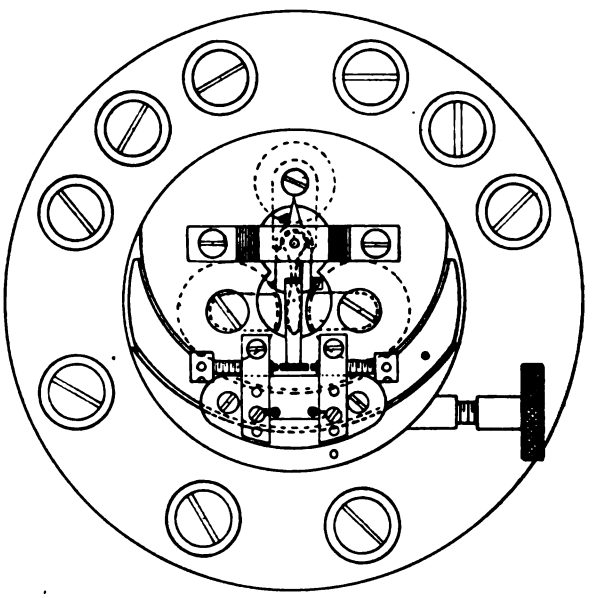

FIG. 32.—TOP VIEW OF STANDARD AUTOMATIC REPEATING RELAY.

current of about 50 milliamperes flows in such a direction as to develop south magnetism at the upper, and north magnetism at the lower, end of its iron core. This energizing coil (wound to 100 ohms resistance) has taken the place of the curved permanent magnet originally employed, as the result of a tendency on the part of the latter to

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gradually lose its magnetism and thus impair the efficiency of the relay.

(To be continued.)

Personal.

Mr. Robert J. Wynne, United States Consul-General at London, formerly Postmaster-General, and at one time a well-known telegrapher, reached this country last week on a leave of absence.

Mr. William Marconi, of London, England, the inventor of the wireless telegraph system bearing his name, was a New York visitor last week and paid his personal respects to the various telegraph and cable interests.

Colonel William Bender Wilson, of Holmesburg, Philadelphia, president of the Society of the United States Military Telegraph Corps, was in town last week, coming over to attend a meeting held in behalf of the society named.

Mr. Henry H. Hall, of Ashtabula, O., an old-time operator, who has just been elected president of the Children's Homes Association of Ohio, is the founder and superintendent of the Children's Home of Ashtabula County. For more than fifty years Mr. Hall was a telegraph operator. He transmitted from Cincinnati the first message announcing the nomination of James Buchanan for the Presidency. In 1857 and 1859 he worked beside James F. Leonard, the reputed first operator to read by sound. Mr. Hall was manager of the Western Union office in Pittsburg when the preliminary convention placed John C. Fremont in the field for President. He sent the telegrams of Horace Greeley, who was reporting the convention. For many years Mr. Hall has been engaged in philanthropic work, in which he has been very successful.

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EXECUTIVE OFFICES.

Mr. Charles C. Adams, second vice-president, announces that construction work on the company's lines connecting Goldfield, Tonopah and other mining centers, will be completed by December 1. They follow the route of the Tonopah and Tidewater Railroad. The lines in question extend north from Ludlow, Ariz., where they connect with the overland system of the company.

Mr. Charles P. Bruch, third vice-president, together with E. B. Pillsbury, general superintendent of the eastern division, have lately completed a general tour of inspection of offices in the New England states.

Mr. Edward Reynolds, auditor of the company, is back from a vacation spent at Catskill, N. Y. During his stay in the mountains an old-home celebration took place, the festivities lasting a week. Mr. Reynolds is secretary of the Greene County Club in New York, which has a large membership of natives of that county who are now residents of the metropolis.

Mr. Minor M. Davis, electrical engineer, went over to Boston the other day, called thither on business connected with his department.

Mr. Arthur L. Edgecomb, superintendent at Boston, who has spent a vacation in hunting deer in the northern wilds of Maine, is back again at his office.

RESIGNATIONS AND APPOINTMENTS.

Mr. H. L. Bush, formerly of Newport News, Va., has been appointed manager at Newbern, N. C., vice H. L. Kellogg, transferred to Washington, D. C.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

At the annual stockholders' meeting, held October 15, two vacancies in the directorate were filled by the election of Paul Morton and Robert M. Gallaway, to succeed Morris K. Jesup and J. D. Layng, both deceased.

At a meeting of the directors of this company held on Wednesday, October 21, for the election of officers for 1908-1909, all of those previously holding office were chosen, namely: Robert C. Clowry, president and general manager; George J. Gould, J. B. Van Every, Thomas F. Clark and G. W. E. Atkins, vice-presidents; A. R. Brewer, secretary; M. T. Wilbur, treasurer; J. B. Van Every, auditor, and George H. Fearons, general attorney. The executive committee was continued as follows: Thomas T. Eckert, chairman; Robert C. Clowry, John T. Terry, George J. Gould, Joseph J. Slocum, Edwin Gould, Frank Jay Gould, Jacob H. Schiff, William L. Bull and Thomas H. Hubbard.

Mr. William Marconi, of London, accompanied by John Bottomly, of the Marconi Wireless Telegraph Company of America, were recent executive office visitors. They were much interested in the Barclay printing telegraph system.

Among other executive office visitors was W. F. Williams, superintendent of telegraph of the Seaboard Air Line Railway, of Portsmouth, Va.

The Barclay printing telegraph system has been installed on the Kansas City-Denver circuit.

The law department now located on the sixth floor of the building, in order to acquire much needed additional space and to effect a closer relationship of legal interests, will remove to the fourth floor, taking possession of the office hitherto occupied by the laboratory, and those by C. F. Patterson, general manager of the American District Telegraph Company of New Jersey. This new arrangement will bring George H. Fearons, the general attorney of the company, and Henry D. Estabrook, solicitor, together. Mr. Patterson will occupy the quarters vacated by Mr. Estabrook on the second floor, and in addition thereto the room tenanted by Daniel Skelton, superintendent of the American District Telegraph Company of New York, the latter in turn being transferred to the rooms formerly devoted to the

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claim department on the same floor. The laboratory and the claim department of the general attorney's office will now be found on the ninth floor.

The Cable.

The Chino-Japanese convention regarding the Port Arthur-Chefoo cable was signed at Tokio, October 12.

The English postmaster-general states that the question of laying a new telegraph cable, or establishing a wireless service to the Shetland Islands, is under consideration.

Mr. Robert Morrell, superintendent of the West Indies and Panama Telegraph Company, with headquarters at St. Thomas, D. W. I., has returned with his family from Europe, after a stay abroad of several months.

Mr. Ernest Grigg, who has charge of the West Indies and Panama Telegraph Company station at St. Croix, W. I., and who has been in this country on a three months' leave of absence, returned to his post of duty a few days since, sailing on the steamer Korona.

Cable communication was interrupted October 28 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Macao	Aug. 29, 1908

Messages can be mailed from Hongkong.

Mr. James M. Robertson, who has been connected officially with the Mexican and Central and South American telegraph companies for twenty-eight years, tendered his resignation to the boards of directors to take effect October 15. The boards of both companies accepted Mr. Robertson's resignation with much regret.

A patent, No. 900,743, for a relay, has been granted to Isidor Kitsee, of Philadelphia. A cable relay comprising the relay proper, a localized electric circuit adapted to move the movable parts in one direction and mechanical means to move the movable parts in an opposite direction, said localized electric circuit shunting the relay proper.

The laying of the new cable of the German South American Telegraph Company to South America has been commenced, says the London Electrical Review. The first section, which will extend from Emden via Borkum to Teneriffe, will be 2,163 nautical miles in length. The cable will then be continued from Teneriffe, either direct to Pernambuco, in Brazil, or to Monrovia, in Liberia, first, and thence to Pernambuco. The length for the direct route from Teneriffe to Pernambuco would be 2,766 nautical miles, whereas the alternative route would increase the length to about 3,766 nautical miles. It is considered that notwithstanding the greater cost of the latter scheme, it would prove to be more remunerative owing to the prospect of the cable being extended to the German colonies in West Africa. "The Blätter für Post und Telegraphie," in making reference to the subject, emphasizes the fact that the German colonies of Cameroon and German South-West Africa can at present only be reached telegraphically by British lines, and that the British and French also possess a cable system to Brazil. There is no doubt that the German nation is keenly alive to the necessity of providing as far as possible a national system of cable, and that it is shirking no expense to attain it.

Radio-Telegraphy.

It is understood that the wireless telegraph experiments recently conducted for the British admiralty by Dr. Lee De Forest have satisfied the admiralty officials, who, under the direction of the inventor, have been testing wireless telephony between the admiralty officials at London and vessels of the channel fleet. The officials express themselves as in favor of the permanent installation of the De Forest system.

In an interview recently Mr. Marconi stated that at present he is planning to do nothing with the Marconi station at Cape Cod, attention being concentrated on the more powerful stations at Glace Bay, Nova Scotia, and that at Clifden, Ireland. Reserve apparatus is now being installed at Glace Bay, duplicating the present equipment there. About 100 horsepower, he stated, is required for transatlantic communication. At present no attempt is made to send more than twenty words a minute.

Wireless telegraphy is being rapidly developed on the Pacific Coast and ocean. It is predicted that within a very few months all of the steamers plying the Pacific Ocean will be equipped with wireless telegraphic apparatus, and steamers destined from the United States to the Orient will be in wireless communication throughout their entire voyages with shore stations at Honolulu, Guam, Fiji and other islands, at all of which points submarine cable connections can be made reaching all parts of the world.

The Signal Corps of the United States Army has linked far-off Nome with Seattle by means of the wireless telegraph. A report from Lieutenant E. Alexis Jeunet, of the Thirteenth Infantry, declares that the wireless stations at Cape Nome, Fort Egbert, Fort Gibbon, Fairbanks and Circle City have undergone successful tests. The station in Nome will be put into service in the immediate future. The work on the military stations was greatly delayed by accidents to supplies in transportation. One of the steamers carrying supplies from Seattle was crushed in ice floes, and salt water worked havoc to the equipment.

Municipal Electricians.

Mr. W. Y. Ellett, superintendent of fire telegraph, Elmira, N. Y., was a business visitor in New York last week, when he took occasion to call on many friends.

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The Study of Telegraph Engineering.

Young telegraphers frequently write to Telegraph Age requesting information relative to what course of action or study is best adapted to secure promotion in the service in which they are engaged. A number of such inquiries coming to hand of late we determined to seek personal opinions to be offered in reply, obtained from among those who are actually filling positions of responsibility in telegraph engineering, those who have gained standing and place the result of their own labor, the demonstration of individual intelligence and worth. We accordingly addressed a note of inquiry to a number of such gentlemen, well known in their respective stations, stating what was required, with the request that we might be favored with an answer, pleading in behalf of our action the welfare of others just entering upon their careers, and for the benefit of the service. We have often had our own say respecting subjects of this character, as our readers well know, and we are glad to be able to publish in this instance opinions derived from other, outside, authoritative, independent and unprejudiced sources.

Here are the letters thus far received, and we bespeak their very careful perusal and serious consideration of the great fundamental truths contained therein.

Mr. J. C. Barclay, the assistant general manager and electrical engineer of the Western Union Telegraph Company, New York, under date of October 17, has the following to say:

My advice to a young operator to become useful in the electric department of the telegraph service is to be observing of what goes on around him, study the principles of the different circuits, obtain theoretical, as well as practical, knowledge of the Morse circuit, the duplex, the quadruplex, and other systems within his observation; acquire an understanding why two or more messages can be transmitted simultaneously over one wire, not simply know that it is done, but how it is done; post himself on the switchboard, learn how to make changes and patch wires, not be satisfied in knowing that changing a wedge or a peg brings certain results, but find why it does so.

The young man who starts in that way and always endeavors to know something more than just what his regular duties call for, will not need much further coaching. He will doubtless acquire the knowledge that fits him for the better position. There never were greater opportunities for advancement in the telegraph service than at the present time, and the young operator who knows how to do things is more in demand than ever.

Mr. Minor M. Davis, electrical engineer of the Postal Telegraph-Cable Company, New York, writes under date of October 19:

Replying to your letter asking me what I would advise a young operator to do to become useful in the electrical department of the Postal company, I would say: If a young operator really has the inclination to learn all about the electrical equipment, and if he has a fairly good education, there should be no great difficulty except the earnest effort that must be made. Beginning with the simplest apparatus, the young operator could gradually become familiar with the operation of every instrument and machine by persistently trying to do so. He should take up the study of one instrument after another, and in following this course he will soon find that his knowledge is increasing. An understanding of the operation of a sounder helps to an understanding of a relay, and so on. He should be sure that he understands Ohms' law, as applied to ordinary circuits, and can begin by studying it in relation to the operation of a simple Morse circuit. The articles by Mr. Willis H. Jones in Telegraph Age will help him greatly. I think that, as a rule, chief operators are very willing to answer questions if the one who asks them is careful not to be troublesome, and does not give the impression that he merely wants to talk the matter over. There are now many good books treating on the general subject of telegraphy and applied electricity, and it is usually easy to get access to them in libraries, even if they are too expensive to buy. In the large cities there are many helpful free lectures upon electrical subjects. Very likely opportunity for study would have to be found outside of regular hours of duty; but this is not a hardship if the interest is real. Nothing stands in the way of a comprehension of every instrument and machine used by the company if the young operator is in earnest. Advancement may be slow, but it has come to most men who have demonstrated they were ready for promotion.

Mr. John F. Skirrow, associate electrical engineer of the Postal Telegraph-Cable Company, New York, in a communication dated October 20, has this to say:

I know of no better way to answer your query than to cite my own experience. While working as an operator I used much of my spare time studying the principles of telegraph apparatus in such text-books as I could secure. On every occasion possible while at work I checked up my study by examination of the instruments and apparatus and by questioning those in charge of them. Before long an opening occurred where some one with a knowledge of multiplex systems was needed to take charge of such apparatus at a summer office. Those who had observed my desire for knowledge recommended me for the place and I started in as a summer chief operator. When the summer was over I returned to the key, but within a few weeks a vacancy occurred in an office due to the promotion of a chief operator, and my application being on file for such a vacancy I was examined and found to be qualified for the position. Further advancement came along the same lines.

My experience has invariably been that by the time I had qualified myself to do better work, the better work arrived.

Mr. F. E. d'Humy, assistant electrical engineer of the Postal Telegraph-Cable Company, New York, under date of October 20, makes this contribution:

A young telegraph operator can prepare himself to be useful in the electrical department of a telegraph company, by gaining a clear, practical and theoretical understanding of the electrical equipment in general use by the company of which he is an employe. The theory is open to all in the many good text-books published, or by correspondence or evening schools. The fundamentals, however, must be mastered first, then all that follows becomes easy. The practical knowledge can be gained only by close observation, application and willingness to lend a hand wherever needed. No matter how disagreeable the work it should be accepted eagerly. A good man learns when pulling on the end of a rope. Knowledge thus gained is the best knowledge. A young man displaying willingness and intelligence is usually soon called upon to help, first, on minor work, then on more important, and so on until ultimately he may find himself regularly employed on important electrical work.

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Mr. J. P. Edwards, division electrical engineer of the Postal Telegraph-Cable Company, at Atlanta, Ga., makes the following reply, writing under date of October 19:

In replying to your letter requesting that I give you a few words as to the advice which should be given a young operator wishing to fit himself for advancement as his knowledge of telegraph engineering increases, the first requisite, of course, is the ambition to advance in the service. If any young operator really has this ambition, he does not require a great deal of advice. First of all he will be discontented with his lack of knowledge of the principles of electrical engineering, as applied to telegraphy. The difficulty which confronts the telegraph companies now, especially in the engineering department, is to find men qualified to fill the positions which are open. The result is that a great many positions are filled with men who are not capable of rendering the service which their position demands. I believe that there is a great tendency in the minds of many telegraph employes, to feel that the companies should take up the raw material, and drill it into ability, rather than for the raw material to fit itself for the position or advancement. You will recognize the bad practice which would result if physicians, for instance, were educated in this way. In other words, if our physicians did not fit themselves before beginning the practice of medicine, conditions would be such in a little while that our graveyards wouldn't hold the 'dead ones.'

The man who is looking for advancement, should be willing to render a service the value of which to his company is greater than his benefits, or his idea of the value of his remuneration, and to feel in so doing that he is merely doing his duty.

I should advise the young operator, in the absence of a thorough training in the principles of electrical engineering before he entered the telegraph service, to prepare himself by taking a course in one of the several correspondence schools giving instruction of this kind. The young operator should not make the mistake of taking a course in 'telegraphy' in one of these schools, as he will be merely taught to telegraph. There are a number of good text-books on the subject of electrical engineering, which would be of great value to the young operator, if he should read them intelligently, but I believe the very best course he could pursue would be to take a correspondence course in 'telegraph engineering,' supplementing this by a full course in electrical engineering, if he sees fit, or by pursuing a course in home reading and study of the various text-books, after the completion of the correspondence course.

Mr. J. F. Looney, division electrical engineer of the Postal Telegraph-Cable Company, at Chicago, under date of October 24, makes this contribution to the subject:

It is first of all necessary that a young operator prepare himself for a position as sub-chief. In this way he can get wide experience in the working of wires, the current necessary to operate different kinds of circuits, testing of wires, instruments, etc. He can gather a great deal of information from books on the subjects, but practical experience is a great help. He must also be reliable and regular, so that he can be depended upon.

A great many young operators do not care to give up their own time to avail themselves of opportunities to learn something that will make them useful and fit them for advancement when the time presents itself and their knowledge of the telegraph business and telegraph engineering has reached a state where they would be valuable to the company.

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International Conference on Electrical Units and Standards.

The conference was begun on October 12 at the rooms of the Royal Society, Burlington House, London. Mr. Churchill, president of the Board of Trade, opened the proceedings with an address, in which he pointed out that fourteen years had elapsed since the last International Congress was held, and welcomed the delegates. Rules of procedure, based upon those employed at the Berlin Conference on Radio-Telegraphy, were adopted, after which Mr. Churchill, on behalf of the British government, nominated Lord Rayleigh as chairman, and retired. .

The first subject discussed was the value of the ohm; the C. G. S. system of measurement was formally adopted, on the motion of Mr. Trotter, and it was agreed that the international ohm should be defined in terms of a column of mercury. Professor Warburg, of the Reichanstalt, proposed a resolution fixing the mass of the column at 14.4521 gm. and its length at 106.300 cm., and adopting the procedure for the determination of its resistance set out in "Specification A." The resolution was discussed and referred to the technical committee.

On October 14, the question whether the volt or the ampere should be adopted as the secondary primary standard was discussed, and the ampere was chosen by a majority of 19 to 4.—London Electrical Review.

The Electrical Review and Western Electrician Consolidated.

The Electrical Review, of New York, has purchased the Western Electrician, of Chicago, and dating from November 7, the two journals will be published at Chicago as a single publication under the title of the "Electrical Review and Western Electrician." Mr. Charles W. Price, in an announcement card, says:

"The present form of the Electrical Review will be continued, and there will be no change in the personnel or management. The publication office will be in the Marquette Building, Chicago, and the present New York offices at 13 Park Row, supported by a strong editorial and business organization, will be maintained."

To initiate commercial business Mayor George A. Hibbard, of Boston, by invitation recently met Patrick B. Delany, the inventor, and H. Lee Sellers, president, of the Telepost Company, at its Boston office, and exchanged greetings with Mayor Adam P. Leighton, of Portland, Me., the message being transmitted over the wires of the Atlantic Telegraph Company, lately acquired by the Telepost Company.

There is much for telegraph operators to learn respecting their calling which can be readily obtained by reading Telegraph Age—$2 a year.

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The Lisbon International Telegraph Conference.

The question of the greatest public interest which was discussed at the International Telegraph Conference, recently held at Lisbon, Portugal, was that relating to code telegraphy. Prior to the Conference of London in 1903, code words could be formed only of real words taken from certain languages, but the Conference of London, in a spirit of liberality, conceded the privilege of using "artificial" words. The intention of that Conference was that "artificial" words should be similar in appearance to real words and capable of being easily pronounced. But the ingenuity of code-makers, eager to obtain the maximum number of combinations, soon led to the formation of codes containing millions of "artificial" words which could only be pronounced with difficulty, if at all; and as telegraph operators cannot grasp such combinations readily, more time is needed for their transmission, with the result that the speed of working is seriously reduced, while the number of errors is largely increased.

It was generally agreed at the Conference of Lisbon that it would be impracticable to withdraw the privilege which had been conceded at the London Conference, and that, in the circumstances, the only course was to maintain generally the existing rules for counting words of different kinds, and to take such steps as were practicable to keep the use of the privilege within reasonable limits by improving the standard of pronounceability.

The matter having been referred to a sub-committee, composed of representatives of Great Britain, France, Germany, Belgium, and the Netherlands, it was finally decided (1) that the test of pronounceability should be the ordinary (or current) usage of each language, and (2) that code-makers should have the privilege of submitting their codes to certain administrations, with a view to obtain an assurance from the International Telegraph Union that the words contained in the codes comply with the regulations.

The power of giving this assurance as regards such codes as are submitted and are found, upon examination, to be prepared upon a proper basis, was confided to the telegraph administration of Great Britain, France and Germany.

The submission of codes for government approval will not be compulsory. Codes which do not possess a government certificate, either because the owners do not submit them or because, when submitted, they fail to satisfy the examiners, will still be available in so far as they may comply with the letter of the regulations. It is obvious, however, that a guarantee that the words in a given code will be accepted without question at any telegraph office throughout the International Telegraph Union, will be a strong recommendation in its favor, and the administrations, by declining to give such guarantee until they are satisfied that it is fully merited by the character of the words in the collection, will be enabled indirectly to exercise a considerable amount of pressure on the persons concerned.

The Conference effected numerous improvement in point of detail relating to the working of the service, and various minor concessions were granted to the public, as, for example, a reduction of the cost of obtaining repetition in cases of error, and permission to use both figure and letter cipher in a single telegram and to combine figures and letters in a single group of five characters when denoting commercial marks.

Paris was selected as the next place of meeting for the International Telegraph Conference in 1915, which will then celebrate the golden jubilee, as the Conference first met in Paris in 1865.

The Portuguese delegation proposed that the jubilee should be commemorated by the erection of a monument similar to that which marks the twenty-fifth anniversary of the foundation of the International Postal Union. The proposal was that the monument should be unveiled at Paris during the Conference of 1915. But the French government intimated that they would prefer that, as in the case of the postal memorial, the choice should fall on Berne, Switzerland, where the International Telegraph Bureau is located, and with this modification the proposal was agreed to in principle, subject to the approval of the respective governments.—St. Martin's Le Grand.

Grievances of English Telegraph Operators.

At the Trade Union Congress, held in England during the second week in September, a resolution was passed protesting against the employment of ex-soldiers and sailors as telegraph operators, at lower wages than those received by established telegraphers. The recommendations of the Hobhouse Committee, advocating an extension of hours from forty-eight to fifty and one-half in some branches, and the exclusion of future entrants as skilled mechanics from the benefits of sick and holiday pay and medical attendance, were condemned, a protest against the practice of permitting newspaper proprietors and news agencies to provide their own operators for transmitting news telegrams was formulated, and the removal of the civil disabilities of civil servants was called for.

The Aurora Due to Sun Spots.

During the recent magnetic disturbance due to the aurora borealis, which played such havoc in telegraphic transmission, Professor John A. Brasher, of Pittsburg, scientist and astronomer, made a measurement of an enormous sun spot, which he photographed. The spot covers an area of 2,250,000,000 square miles of the surface of the sun and has a temperature estimated at 60,000 degrees above zero. Dr. Brasher believes there is a close connection between the aurora borealis and the sun spot.

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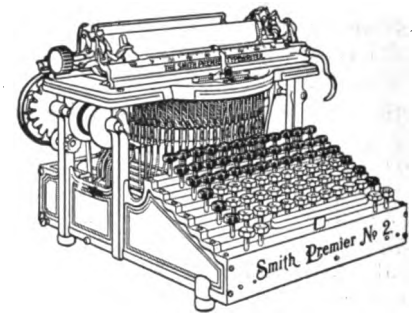

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NOVEMBER 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

All the Fault of the Telegraph Company.

The impelling causes that induce suits at law are many and varied. Some owe their origin to ridiculous circumstance. The telegraph companies are not without experience as defendants in answer to innumerable and frequently fantastic complaints, diversely conjured up and brought against them. A man possessed with a sense of humor, with the dramatic instinct, with the faculty of picking up matter for editorial squib or for storied sketch, may confidently approach the law department of the telegraph satisfied that his search for material wherewith to embellish his page, will be rewarded.

Kentucky has always maintained a reputation, sometimes fierce and never uninteresting, in the arena of the law. The other day in this former favorite hunting ground of the North American Indians, a suit for damages was brought against the telegraph. It seems that in a moment of apparent abstraction, yet with a confidence born, may we say, of blissful innocence, a citizen of that state, but of what station in life we are not informed, having occasion to leave his carriage, requested a messenger boy to hold his horse for him at the curb's edge, for a few minutes. With the good nature characteristic of his kind, the lad obligingly grasped the rein near the bit and patiently stood by while the owner of the animal went in discharge of his errand. This was an exemplification of duty well begun. But trouble was brewing. What caused the horse to awaken to a realizing sense of the comparative freedom of his position, is not known. Whether acting in contempt of the diminutive figure standing by his head and refusing to yield obedience to a stranger whose only distinction from the ordinary small boy of the town was the uniform which he wore, unlike the livery of any coachman or footman the equine might ever have known or observed; or whether seized with a sudden impulse to measure his locomotive powers with a passing auto, or startled by the sound of music produced by a street band around the corner—whatever the reason, the horse with a sudden jerk freed himself from the boy's grasp, the same having been held in meditative and unsuspecting mood, after the manner of messenger boys, as all observant witnesses of that genus will cheerfully testify is their natural attitude when on duty—whatever the reason, we say, the horse broke away and started at a mad pace up the street.

Disastrous consequences, of course, could only be the natural result of such a wholly rash and unwarranted movement, and when the owner finally appeared on the scene and gazed upon the wreck spread before him, not in grief but in anger, he forthwith declared in tones that by no stretch of the imagination could be called dulcet, that the telegraph company was accountable for the calamity. Only a mind of vast occult power and fine discrimination could have traced thus instantly the subtle agencies determining relation between cause and effect, and sternly place liability where it belonged. Such a spontaneous decision marked the triumph of intellectual force clearly rising to the height of genius. The telegraph company should be taught a lesson, its responsibility should be determined and fixed by a court of law, a limit should be placed upon its operations; it should be severely admonished that its business was the transmission of messages and not to lend itself as an influence in causing horses to run away. Here was a grand opportunity to vindicate the rights of the people against grinding monopoly!

Damages caused by the runaway accident were speedily computed by the discomfited owner to be $250, and for this lump sum the majesty of the law was invoked against the offending telegraph company. An ignorant populace conversant with the facts, applauded the move, and held their mouths agape in awe and wonderment at the pro-

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ceedings. Others, not so sure of the reasonableness and equity of the claim, wore a broad grin. When the case came to trial and the learned judge promptly dismissed the action, of all those called in attendance none were more interested in the outcome than the aforesaid messenger boy, whose relief and satisfaction found vent in the remark: "Gee, I'se t'ought de old bloke was gwine fer to bust de company!"

The Wisconsin Decision.

The decision of the Supreme Court of Wisconsin against the state eight-hour law, which was referred to in our October 16 issue, for railroad telegraph operators is significant in reflecting the new spirit in which legal questions affecting the railroads is being met. The decision rests upon the power of the federal government to regulate interstate commerce and its adjuncts, to the exclusion of state regulation where it overrides or changes the decree of Congress.

Ability and independence have marked the Supreme Court of Wisconsin and its decisions have always been highly regarded by courts in other states, remarks an exchange. Its invalidation of the state eight-hour law for railroad telegraphers gives a decision of far-reaching importance, affecting state laws which add to the measures adopted by Congress for the regulation of railroads. It is logical that if the states cannot regulate the hours of railroad telegraphers, there are other phases of regulation that they have undertaken which are invalid. When the states that went in heavily for regulation brought about confusion in the operation of railroads by adding to the numerous changes required under the Hepburn law, it was not believed that many of the additions would stand legal test. As the states commenced enforcement of their new laws, common carriers were subjected to conditions that obstructed operation and worked serious loss to the railroads, without, as subsequently proved, affording better conditions to shippers and travelers. The necessity of systematic and uniform laws applying to commerce and transportation became apparent simultaneously with the attempted enforcement of the state laws. The Minnesota rate decision cleared away some of the confusion, but numerous state laws remain that are in the same position as the Wisconsin eight-hour measure in their relation to the federal law. They should be eliminated, and the public and the railroads would both be gainers by the elimination. This must be apparent after the hearing of complaints by Alabama and Georgia before the Interstate Commerce Commission in Atlanta, when these states invoked the federal law for a relief that the state laws were unable to give.

An extension of the Wisconsin decision will be of advantage in other states and can be obtained without raising the cry of "state rights," which was behind state regulation of the railroads. The state regulation, as far as it has gone, has harassed the railroads without any benefit to the public. As a matter of fact, the public has lost with the railroads because reduction of revenue has lessened efficiency and prevented improvements. It is just as well to look the facts in the face and support the courts when they draw the line between legitimate state regulation and the state regulation that invades the field of interstate commerce.

The head of a light company at Fort Worth, Tex., himself a former judge, adopted drastic measures the other day when he appeared on the scene armed with a shotgun, and forced the city lineman, who had commenced the cutting away of wires, said to be dangerous, to quit his job and hurriedly descend from his coign of vantage on the pole. Might does not always make right either when directed for or against any given object, but in this case an apparently reckless cutting of wires, which included telegraph call circuits in its demolition, as well as those providing for a lighting service, was happily frustrated. A show of municipal sanity afterward prevailed when a truce was declared in order to give the energetic judge an opportunity to obtain an injunction.

Telegraph tolls in Oklahoma have been cut to a flat rate of twenty-five cents ten words, and two cents for each additional word, day rate, and one cent night rate to all points within the state, by a proposed order signed by the corporation commission, October 3. The order also requires every telegram to show the time of filing and receipt, so that the recipient can tell for himself whether it has been delayed in delivery.

"Telephony," in the shape it now reaches us, having merged within itself the American Telephone Journal, Sound Waves, the Telephone Magazine and The Telephone, presents a compact, condensed whole, at once stronger and better and in every way superior to the previous separate and diverse units. Telephony has become a trust in telephonic newspaper literature in the best meaning of that much-abused and misunderstood term, and as such has a warmer welcome always at our editorial table.

Mr. J. McMillan, superintendent of the Canadian Pacific Railway Company's Telegraphs, at Calgary, Canada, writes: "I thank you for keeping my subscription good. I take great pleasure in assuring you that in my opinion Telegraph Age is the most helpful and instructive telegraph journal published to-day, and no man, young or old, can afford to be without it. Telegraph Age keeps abreast of the times and represents the best there is in telegraph interests."

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Telegraphy and Telephony Over Electric Light and Power Circuits.

An arrangement permitting the use of electric light and power circuits for telegraphy and telephony has been invented by Professor R. B. Goldschmidt, of Brussels. Results obtained by him over 110 or 220-volt lines are said to be equally good. The circuits may at the same time supply any number of electric lights and motors without the slightest disturbance. The transmitting device comprises a sensitive and powerful microphone, capable of withstanding currents of great intensity, which is connected in the circuit of an accumulator, a coil of thick wire and an adjustable resistance for regulating the intensity of the currents through the microphone. The coil forms the primary of a transformer, the secondary of which contains a great number of turns of fine wire of sufficiently high resistance to make the insertion of additional resistance unnecessary, when the secondary is connected to the electric light or power line. When the microphone is spoken into, the voice produces in the secondary circuit of the transformer alternating-current oscillations, which superpose themselves on the direct current flowing through the conductors, and, the direct current being scarcely influenced by alternating currents, as is well known, the latter act on the telephone at the receiving end through another transformer, similar to that at the transmitting end. The calling apparatus consists essentially of a toothed-wheel interrupter placed in the circuit, which, when rotated, produces electric currents in the transformer at the receiving end. A sensitive relay connected in the secondary of this transformer serves to establish a local circuit through a battery and bell. A condenser is connected around the interrupter for the prevention of heavy sparks. When the telephone receiver is hung on a hook, the secondary circuit is closed by the relay; when the receiver is removed the hook rises and the telephone is automatically connected in the secondary circuit of the coil. In order to telegraph it is only necessary to substitute a Morse key for the calling device, and a Morse apparatus or sounder at the receiving end for the bell. Experiments made by Professor Goldschmidt have shown that during the day the transmission is effected as perfectly as over ordinary telegraph and telephone lines, but in the evening, when many local circuits are simultaneously opened and closed, the transmission is a little more difficult. Among the practical applications of the invention are the sending of telegraphic or telephonic messages simultaneously from a central station to a number of subscribers, and communication between central stations and electric railway cars. On account of the high resistance of the transformers the current consumed is almost negligible and the devices are not much more expensive than those ordinarily used.—Translated and abstracted from L'Electricien (Paris), by the New York Electrical Review.

Annual Report of the English Telegraphs.

The report of the Postmaster General of England, for the year ended March 31, 1908, shows that 85,969,000 telegrams passed over the post-office wires, as compared with 89,493,000 in 1906-07, a decrease of 3.9 per cent. The decrease in the number of telegrams was to some extent apparent only. The decrease in the number of ordinary telegrams was most marked in the case of London local traffic, and was due no doubt to the increasing popularity of the telephone. In connection with the revision of the system of counting messages, the Postmaster-General caused a careful and prolonged inquiry to be made into the expense of transmitting press messages, and found that the loss to the state on these messages, which passed at the special rates prescribed by the Telegraph Act of 1868, might be estimated at about £225,000 a year. There was a deficit on the telegraph and telephone systems of £851,876, or £209,178 more than in the previous year. The number of foreign telegrams sent to and from the United Kingdom during the year (exclusive of certain telegrams dealt with entirely by cable companies) was practically the same as the number sent during 1906-7, viz., 9,147,000. During the year thirty-nine licenses (covering fifty-eight installations) were granted under the Wireless Telegraphy Acts. Of these thirty-seven were for experimental purposes and two for private business purposes.

First News of a Great Crimean Victory.

The first message bringing to London, England, the news of the victory of the British and French troops in the battle of the Alma, fought on September 29, fifty-four years ago, was received by Mr. W. J. Pragnall, then an operator in the service of the Electric and International Telegraph Company.

Mr. Pragnall describes the incident as follows: "On Sunday, September 29, 1854, when all was quiet, The Hague called and said, 'Look out, important telegram for the government.' This, which I received, was the message announcing the victory. Immediately afterwards we were overwhelmed with other telegrams for the press and from generals, officers, and others to their parents, wives, etc. Later the lists of the killed and wounded came through. These were sent to the official Gazette office in St. Martin's lane and printed and distributed. Then came another rush of messages to relatives and friends all over the country. Many of them had to be kept until the offices opened on Monday morning. It was an afternoon and evening long to be remembered in London telegraph circles."

Mr. Pragnall entered the service of the Electric and International Telegraph Company on December 23, 1849. He is, therefore, an honored forty-niner of the British telegraph service.

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The London Central Telegraph Office.

For some time engineering changes in the wiring arrangements of considerable magnitude have been taking place in the central telegraph office, London, and now the cabling and general wiring is as well arranged as it can be, having regard to the fact that the general post office west building is not particularly suitable for housing the largest telegraph office in the world. The objects aimed at were, in the first place, to secure immunity from fire risks, and secondly, to facilitate and reduce the cost of changes in the positions of circuits, which the exigencies of the traffic in the central telegraph office appeared so frequently to demand.

In October, 1907, the final installation of the metropolitan intercommunication switch was completed, and as a consequence of the amount of table space set free, and for other reasons affecting staff administration, a re-organization of the central office was decided upon. The work, according to a return which the controller prepared, involved the removal from one portion of the building to another of nearly fourteen thousand pieces of apparatus, and was accomplished without the slightest hitch or delay to traffic.

The circuits are now located as follows: Ground floor, switch working sets for tube office traffic and the message telegram room; first floor, telegraph school; second floor, cable room—circuits working to south-southeast offices, minor midland and northern offices; third floor, main provincial circuits, also Scotland, Ireland and the Channel Isles: on this floor also are the news and special sections; fourth floor, metropolitan intercommunication switch, its working sets, direct circuits to certain metropolitan offices, and circuits working to the home counties.

Incidentally an increase in the number of cord telegraph carriers, concentrator switches and a rearrangement of the penumatic tube system were contemplated, but these portions of the scheme are being proceeded with slowly. Experiments are now being conducted with a view to determine the most suitable arrangement for working the pneumatic tubes automatically. Two types of valve are being tried, one actuated by what may be termed a pneumatic relay, and the other being operated electrically.

Authority has been given for a trial of the Murray system to Berlin, the apparatus now in use at the central telegraph office on a Dublin circuit being utilized.

Efforts have for some time been made by inventors to increase the speed of preparing slips for Wheatstone automatic transmission. It was, of course, at once realized that the typewriter principle was the correct one, and this has been adopted by all the inventors. The first system tried was the Creed, which used air for perforating. Recently M. Kotyra, of Paris, devised an arrangement by which the pneumatic perforators in use in the central telegraph office were operated by three solenoidal electro-magnets placed over the valve pistons. A typewriter keyboard is employed, the depression of the keys bringing into action a motor-driven rack and pinion device which provides by means of a brush passing over horizontal segments for the completion of the electro-magnet circuits. M. Kotyra has recently modified his apparatus, dispensing with the pneumatic perforator and operating a four-slip perforator directly by solenoidal electro-magnets of more powerful construction. He has also introduced a much improved form of keyboard.

The Gell two-slip keyboard perforator, which was originally tried in conjunction with a key-speed Wheatstone transmitter for sounder working, and a four-slip perforator of similar but stronger construction are also being tried experimentally in the news division. In the Gell instruments each letter or figure is perforated by one operation, and in this respect the Gell differs from the Kotyra.—Post Office Electrical Engineers' Journal, London.

Lead-Covered Cables Injured by Insects.

The Home Telephone Company, of Santa Barbara, Cal., has been having considerable trouble from perforations in its lead-covered cables made by insects, says the Electrical World. Some of the trunk lines consisting of three hundred to five hundred wires in lead casings, have been found to have hundreds of perforations about one-eighth inch in diameter, evidently made by the insects, with the result that there has been considerable interruption of telephone service.

This kind of damage to lead-covered cables was made the subject of a paper by Mr. John Hesketh, electrical engineer for the State of Queensland, Australia, presented before the St. Louis International Electrical Congress of 1904. The matter was investigated by Mr. H. Tryon, entomologist for the Queensland Department of Agriculture, who reported that the greatest damage to the cables was caused by the larva of the beetle Eceloneurus, but that the beetle Xylopertha and also the beetle Bostrichus Jesuita were taken from holes in lead casing. In experimenting with other insects it was found that the elephant beetle would gnaw through the lead sheating of a cable, and also the caterpillar Xyleutes boisduvali. In the discussion of Mr. Hesketh's paper, a case was noted where a grub about one and one-half inches long had done considerable damage to cables in Savannah, Ga., and an article published at that time gave an account of similar damage to cables in Shanghai, China, but which was ascribed to wasps.

An increase in the pay of telegraph operators in India has been approved by the Indian Telegraph department.

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Interesting Cable Exhibits at the New York Electrical Show.

In the comparatively short time of the development of electrical possibilities one would scarcely expect to find a history of much extent or of much romance. Yet in the exhibit of the Commercial Cable Company, at the New York Electrical Show, held in Madison Square Garden, October 3-14, commemorating the fiftieth anniversary of submarine cable communication, and showing the growth and expansion from the beginning, there was an exceptional interest both in the mechanical perfection of the present, and in the background of achievement amid the first difficulties.

The apparatus by which messages under the sea are sent now was shown in a complete set of instruments and devices for sending and receiving, put side by side with the early flashlight mirror system. The alphabetical code transferred by the siphon tube to the narrow ribbon and the perforated tape used in sending were explained in detail.

Models of two ships, the Mackay-Bennett of the older type and the Restorer, built in 1902, gave illustrations of actual laying of cables, of the means of paying out, grappling and taking in, and of repair work. Pictorial representations of the other ships which played a part in the construction of the cable lines, the Leopard, Agamemnon, Niagara and Susquehanna of the Atlantic telegraph cable fleet and the Great Eastern were hung on the walls.

The difference in the working capacity of the cable of 1858 and that of to-day appears in copies of two early messages, one of them sent the day after the cable was laid and the second five days later. The first one reads:

Valencia, Aug. 17, 1858. Commenced 12.56, finished 1.21. Rec'd by Lundy and Bell. Ward, Whitehouse mr Cunard wishes telegraph McIver Europa collision Arabian put into St. John's. No lives lost. will you do it stay anxiety nonarrival. DeSanty.

The second despatch tells of rejoicing in the United States at the accomplishment of the cable transmission, and ends: "Please give me some news for New York. They are mad for news." The time occupied in sending the two messages was twenty-five and twenty-three minutes, respectively. Now two of equal length could be sent and transcribed in less than one minute.

In the pictorial description of the laying of the early Atlantic cables, there were a number of watercolor paintings of scenes aboard the Great Eastern, and of the landing of the ends at Heart's Content, Newfoundland, and Valencia, Ireland. The watercolors are the originals of those made by Robert Dudley to illustrate a pamphlet by W. H. Russell, LL.D., dedicated to Albert Edward, Prince of Wales, by special permission, and published in 1865. Forty-four pictures in all were in the exhibition. Besides these, the Metropolitan Museum of Art loaned several oil paintings which deal with the history of submarine cables.

In glass cases were cross sections of the different cables of the world, showing the variety of construction suited to the conditions of location. The thickness decreases as the cable reaches mid-ocean, from three or more inches at the shore ends to an inch in deep water, because the wear on the rocks near the shore is so much greater than in motionless depths of several miles. A part of a Siemens cable, made especially to be used in ice-bound seas, heavily armored to withstand the cutting of ice, was shown. A large case presented to the New York Electrical Society by the heirs of Cyrus W. Field had almost fifty sections of various cables in which the pioneer had an active interest.

The identical apparatus used in a famous experiment was on exhibition as a curiosity. In the demonstration of the utility of low-tension currents for the transmission of signals through submerged cables, Latimer Clarke, of England, in 1866, used a cell made of a few drops of acid in a silver thimble, weighing a grain or two at most. It was proved that by means of a cell as small as this conversation could be carried on over a stretch of 3,700 miles, giving strong deflections of the flashlight, though slower in transmission than the high-power cells, taking a full second to traverse the cable.

GUN CAP BATTERY, HALF THE ACTUAL SIZE.

In 1866 William Dickenson, an American electrician, not to be outdone by Clarke, transmitted messages from Heart's Content to Valencia, using a cell made of an ordinary gun-cap and a drop of acidulated water, as the account says, "the size of a well-formed tear." The deflections obtained by this miniature device were correctly read, though the receiver admitted that they were "awful small." In comparison with this was the tremendous power used in the operation of the 1858 cable, consisting of 380 or 420 Daniell cells, which caused its quick destruction. The little gun-cap cell referred to, which is now the property of Mr. H. H. Ward, a forty-niner of the telegraph, of East Orange, N. J., was on exhibition. Accompanying it were the following letters:

New York, April 27, 1887.

My dear Mr. Dickenson:

Some years ago Tom Scanlon sent me what he alleged to be the veritable gun-cap battery with which the cable was worked. It was a common percussion cap with a piece of wire soldered to it and a narrow strip of zinc to be inserted in it. If the history of it is correct I wish you would somewhat formally authenticate it to me, as after so many years the real article possesses some historic interest.

With kindest regards to yourself and other friends in Heart's Content, I remain,

Yours faithfully,
H. H. WARD.

William Dickenson, Esq., Electrician,
Anglo-American Tel. Co.,
Heart's Content, Newfoundland.

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Heart's Content, June 19, 1887.

My Dear Ward:

Yours of 27th April re gun-cap battery: In 1866 a battery was made at Valentia station out of a lady's silver thimble, and signals sent to Heart's Content. Not to be outdone, I made a battery out of a common percussion cap. Mr. Dean, of the United States Survey, was in Heart's Content, and Dr. Gould, his colleague, was in Valentia. "V. A." was called with the usual working battery. It was removed and the gun-cap battery put in the place of it, and the following sent:

"Mr. Dean's compliments to Dr. Gould. How are you?" Ans. Dr. G. to Mr. D.—"Splendid." Clerk at V. A.—"Please increase your battery. Signs awfully small." The same battery made of the gun-cap I gave to T. D. Scanlon, I think in the summer of 1868. Trusting you are in health, I remain,

Yours sincerely,
WILLIAM DICKENSON.

New York, July 25, 1887.

Mr. Dear Scanlon:

Greeting. May you live a thousand years—or to that good old age in which your powers will all have rounded out and perfected and you are ripe for a saintly title—then you may depart in peace and be gathered to your fathers. But first—before you go—I want your "affidavy;" or, to explain more fully, you remember that you honored me long ago by presenting to me the gun-cap battery with which the cable was worked. I have it still. In the lapse of years it is beginning to be considered an interesting bit of history. In order to make its title clear I wrote lately to Dickenson, and he has verified the facts of its use and given me the message sent at that time, and stated that he gave it to you. I will be much obliged to you if you will write a paper certifying that in the year 1868—or thereabouts—you received from William Dickenson the gun-cap battery with which signals and messages had been transmitted across the Atlantic, and that you gave the battery to me. A simple letter stating the facts signed by you is all I want. With kind regards,

Yours faithfully,
H. H. WARD.

T. D. Scanlon,
St. Johns, Newfoundland.

Anglo-American Telegraph Co., Limited,
St. Johns Station Newfoundland,
August 6, 1887.

Dear Mr. Ward:

It was in 1870, I think, that I presented you with the identical gun-cap used by Mr. Dickenson when experimenting in '68 on the cables between Heart's Content and Valentia. He continued using power generated in a lady's thimble which gave strong deflections in Ireland. Water was added to the battery till nothing but water remained, and still Valentia continued o receive. Mr. Dickenson was then induced to try a still smaller cell, and a common percussion gun-cap was connected up and charged with a drop of acidulated water, resulting in complete success. The signals therefrom were distinctly read at Valentia and some messages transmitted.

Yours truly,
T. D. SCANLON.

Henry H. Ward, Esq.,
Cashier, W. U. Tel. Co., New York.

Among the interesting souvenirs was an amusing programme of an entertainment held aboard the Great Eastern. The first page announces that it is a "Cableistic and Eastern Extravaganza, by N. A. Woods and J. C. Parkinson, showing the inexplicable and vitrified adventures of a Gurnet, a Milton oyster, a Barbel, and other queer fish, being an un-Varleyized tale of a tank." The dramatis personæ include the following members of the ship's company: "Glass, a young man from the country, Mr. Dudley; Neptune, an old man of the sea, Colonel de Bathe; Gooch—Not Daniel Lambert a Great Eastern—Mr. G. W. Elliott; Field, of the cloth of gold, Captain Bolton; a sea monster (a A-B-Sea one), Mr. H. F. Barclay; first Mermaid, poor though virtuous, Mr. Poore; second Mermaid, a vaunting female, Mr. Vaughan; several Tritons (Rightun's and Tightun's, Though Trite-un's) unavoidably absent. The captain's gig and the (gun) carriages may be ordered at any hour precisely."

The remarkable collection of bibliography of electrical knowledge was arranged in several cases, showing the famous works of the first scientists on the subject. Copies of both the first and second edition of Gilbert's De Magnete, published in 1600 and 1628, respectively, were in the collection. The title-page of the edition of 1600, which was the first book published on electricity, reads as follows:

Guillielmi Gilberti, Colcestrensis, Medicii Londinensis. De Magnete, Magneticisque Corporibus, et de magno magnete tellure, Physiologia Nova, plurimis et argumentis, et experimentis demonstrata. Excudebat Petrus Short, Anno MDC, Londini.

Besides these there were original editions of Cabeo, 1629; Boyle, 1675; Ampere, 1822; Ohm, 1827; Franklin, Field, Varley and many other writers on electrical science. Many pamphlets concerning the Atlantic cable, written in the middle of the last century, deal more directly with the history of submarine telegraphy, and give a contemporary account of the first experiments.

The Telegraph in the Bahamas.

The Colonial report of the Bahama Islands for the year 1907-8, states that the revenue of the telegraph department was £1,248, and the expenditure £545. In the previous year the revenue was £1,258 and the expenditure £552. A total of 3,847 messages passed over the cable to Jupiter, Florida, where connection is made with the Western Union Telegraph Company. The total number of messages in 1906 was 3,836, and in 1905, 4,419. As regards the telephone service, there are 218 stations now in operation in Nassau and suburbs, all of which are under the direction of the superintendent of telegraph, P. H. Burns.

Miscreants for some unknown reason are trying to destroy the line of the Western Union Telegraph Company between Stanton and Newark, Del., and thus far their efforts have been so successful that a sixteen-wire pole line connecting New York and Washington has been completely put out of business for several hours at a time. Several of the poles recently were bored full of holes and then the holes were filled with oil, which was ignited and the poles burned to the ground, the wires falling with them. The damage was repaired the next day, and then the poles were sawed off close to the ground, again carrying down all the wires.

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Electrical Transmission of Time Signals Without Wires.

A system for the distribution of time signals by means of Hertzian waves, invented by Franz Morawetz, of Vienna, is described in L'Industrie Electrique, Paris, September 10, by Dr. A. Ferla, translated by the New York Electrical Review. Attempts in this direction had already been made, but have failed on account of disturbances caused by extraneous waves, atmospheric and electric. The inventor conceived the idea of constructing an apparatus which remains in circuit only during one second. As soon as an electric wave strikes it, it is disconnected from the circuit by a suitable clockwork and remains in this condition for fifty-nine seconds. Thus, the apparatus is capable of receiving a signal only during one second out of sixty and can be actuated only once in a minute, either by a wave intended for this purpose, or by some other wave. Mr. Morawetz, in conjunction with Professor Reithoffer, of the Vienna Technical High School, investigated the behavior of electric waves in a large city and the construction of apparatus for their utilization. A central station was installed in 1905 on the roof of the Technical Institute in Vienna, for which the municipal council granted a subsidy of 3,000 francs, and the best form of antennæ and the most favorable wave length were studied. The experiments showed that a wave length of 765 meters had the necessary inflection to overcome the inequalities of the territory. In 1906 the influence of atmospheric electricity on the apparatus was investigated and observations were made simultaneously at two receiving stations, one at Breitensee and the other at the Siemens-Schuckert works on the Praterquai. An increase in atmospheric electricity often manifested itself hours before the formation of clouds indicating a thunder storm. An extraordinarily violent thunder storm, which struck Vienna in July, 1907, did not disturb the system in the least and proved its complete insensibility to atmospheric electricity. Although the discharges succeeded one another almost without interruption, the clocks continued to keep exact time. The waves sent out from the central station could be distinguished very clearly from the atmospheric sparks at the coherer by their color. During the trials it was likewise demonstrated that large masses of metal are no obstacle to the propagation of electric waves. The metallic cupola of the St. Charles Church is between the central and one of the receiving stations, but with the wave-length employed the signals arrived without being disturbed or weakened in the slightest. During the experiments the sending and receiving instruments were perfected. At the central station the high-tension wave transmitting apparatus is actuated by an electric clock invented by Mr. Morawetz. This clock is capable of closing the circuit of a transformer during a time-interval of either one, two, three or four seconds and from one to three times per minute. The secondary circuit of the transformer charges a battery of one hundred Leyden jars, which is discharged across a spark-gap, producing radiating electrical oscillations in the antennæ. As the radiation cannot be produced on one side of the circuit only, the other terminal is connected to the ground. At the receiving station in Breitensee a steel tube pole, twenty meters high, is installed in a wooden socket. The antennæ consist of copper wires suspended from an insulated cross-bar at an angle of forty-five degrees. The wires are joined at the bottom, enter the station through a glass tube and are likewise connected to the ground. When the waves reach the receiving antennæ, which must be in resonance with the oscillations, a system of induction coils and condensers transmits them to the coherer, and the latter closes a local circuit by means of a very sensitive relay. The chronometric apparatus of Mr. Morawetz, the principal part of the invention, consists essentially of a clock movement which, when actuated by the waves, interrupts communication with the receiving devices, so that signals can be received only during a predetermined number of seconds. If any extraneous wave arrives at another time it operates the apparatus at the receiving station, but the wave from the central station remains ineffective. In such a case there will be a slight discrepancy between the central and receiving stations, which will, however, be compensated during the following minute and can not exceed a few fractions of a second. The secondary clocks at the receiving station may, of course, be of any construction. The advantages of this system are that the operation of the central station can be effected by a single master clock, that the installation of a great number of circuits is rendered unnecessary, and that the system may be extended without limit over a whole city, and eventually, by increasing the power at the transmitting station, over a whole country, without danger of disturbance. The cost of such an installation of clocks will be very nearly equal to that of a corresponding number of mechanical clocks, and it may be concluded that they will be the clocks of the future.

The Telegraph in Paraguay.

The British Consul at Asuncion, Paraguay, in a recent report, states that, during 1907, telegraphic communication was established between Asuncion and Villa Encarnacion. This line consists of 1,945 kilometers, or 1,208 miles of wire, and was built at a cost of about $32,344. A cable between Asuncion and Posadas is shortly to be laid, and will thus connect Paraguay and Argentina by one single line. Telegraphic communication between the town of Bella Vista, on the Brazilian frontier, is also in course of construction, and will, when completed, unite these two countries as well. A wire from the village of Jhu to the River Parana, opposite the Jguazu Falls, is also contemplated.

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Mr. Harriman Gives Wise Counsel.

Mr. E. H. Harriman, who owns and controls more railroads than any other man in the world, states that the opportunities for young men are far brighter to-day than they were forty years ago. This is an age of incomparable activity in every line of human endeavor. In the United States it calls for the driving power, the excess of vitality, that dwells in the man whose years do not number two score. There never was a time, he goes on to say, when mechanical skill, executive talent, and sheer intellect had so eager a market as now; when these qualities were so readily and steadily convertible into cash. Conditions are far easier for the young men to-day than ever before. True, the opportunities for seizing upon the natural resources of the country are not so wide as in the sixties or the seventies, but he doesn't have to wait until old age, as did his father or grandfather, to enjoy the belated harvest.

He needs make no such sacrifice as was made by nearly every man who pioneered it west of the Mississippi, nor endure such hardships. Earning a competency in thickly settled regions entails less labor and privation than in a wilderness. The main reason why so many young men look on the future with doubt is that they haven't learned to do one thing well. If you expect high wages, you must give high service. This requires thorough training and over-average aptitude, whether your vocation is sawing lumber, superintending a mine, building a bridge, or preaching sermons. In the mechanical arts, in business, and in the learned professions, you must specialize. There is no room for the Jack-of-all trades, nor for the novice, except at apprentice pay. Another reason why multitudes of young men have small hope of success is that they have never been taught, and therefore have not acquired the habit of systematic saving.

Inquire into the beginning of American fortunes, and you will find in practically every instance that it was the first thousand dollars saved that laid the foundation. Even those who afterward accumulated great wealth by questionable methods, got their start from the first thousand they laid by. And let no normal young man who has learned to do one thing well, and is free from exceptional family burdens, say he can't save a thousand dollars. He must do it if he desires independence. One excellent plan for putting by the first thousand dollars is to assume that your income has been cut down. Then save this reduction. Suppose there should come a period of depression, such as we had from 1893 to 1897, and your wages of necessity were reduced twenty per cent. Would you run away from your job and jump into the river? No.

You and all your fellow-laborers would adjust your living expenses to conform to the smaller income. Now, is it going to call for any considerable sacrifice or privation to do this? The act will involve not even a shadow of acerbity, because it is voluntary. Neither your employer nor industrial conditions enforced the reduction. After you have saved the twenty per cent. you will still be provided with all the necessities of life, many of the comforts and a few of the luxuries. If your income is $1,000 a year, it will take you only five years to save the first thousand, assuming that the savings lie idle all the time. Unless you are a lunkhead, your earnings will be more at the end of five years and your proportion of savings much larger. By that time you ought to have acquired the habit of systematic saving, which is quite as easy as the habit of spending every cent you earn. No one is counseling you to get down to the scale of living that obtains among folk of your own station in Europe; all you are asked to do is to live rationally and comfortably.

The new sensation of a growing bank account, or ownership of a piece of productive property, together with the knowledge that you are creating for yourself your old-age pension, will more than compensate for the consciousness that you are wearing your clean and serviceable winter suit through its second season. It will enable you, without a blush, to enjoy grand opera or Shakespeare from an inexpensive seat near the ceiling. It will foster a feeling of self-respect and manliness that the spendthrift does not know. Only one young man in a hundred thousand has the combination of greed, intellect, enterprise and opportunity to become a captain of industry; but every young man endowed with health has the capacity to achieve financial independence.

Her Changing Mind.

One afternoon not long ago a young woman stepped up to the telegraph counter in a local department store and in a trembling voice asked for a supply of blanks.

She wrote a message on one blank, which she immediately tore in halves; then a second message was written out that was treated in the same way; finally a third was accomplished, and this she handed to the operator with a feverish request that it be "rushed."

When the message had gone on the wire and the sender had departed the operator read the other two for her own amusement.

The first ran: "All at an end. Have no wish to see you again."

The tenor of the second message was: "Do not write or try to see me any more."

The third was to this effect: "Come at once. Take next train if possible. Answer."

M. J. H. Dorsey, all-night chief operator of the Postal Telegraph-Cable Company, Los Angeles, Cal., writes: "The editorial, 'Further Considerations of Importance,' in your October 1 issue, was fine. Every operator in the United States ought to have it pasted in his hat."

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Buying a Mine by Telegraph in Early Days.

"Old Farmer" Lawton, of the Western Union, Denver, who is not what could be termed a wealthy man, has, by prudent investments, saved up a competency in the shape of a good farm and other property. "I managed it," he said, "simply by watching how successful men handle their affairs and not trying to imitate those that plunge.

"It's amusing," he said, "to see how impatient some people become over other people's affairs. Only yesterday I overheard a resident of this city remark about the apparent slowness in the construction of the Moffat road. While that gentleman has lived in Colorado for many years and has made and lost two or three fortunes in mines, he has evidently never watched the successful careers of the men who are opening up one of the richest sections of the state with a railroad whose engineers are constructing the road so substantial that it calls for the most flattering words from the greatest railroad builders in the country.

"Take D. H. Moffat, who is pushing this great enterprise that is soon to bring the undeveloped portion of northern Colorado, southern Wyoming and northeastern Utah into communication with the outside world. Did you ever know Mr. Moffat to do anything on the spur of the moment? Has he not been forty years in building up one of the greatest banking houses of the country? Were it not giving up the secrets of the telegraph I could tell you exactly how it was accomplished. However, one little instance occurred back in 1879, of a verbal nature, no records having been kept, and of which I can speak.

"Mr. Moffat had become half owner in the Little Pittsburg mine in Leadville, in partnership with H. A. W. Tabor. The soft carbonates were being hoisted out of that one mine at the rate of over $1,000,000 a year. It made Mr. Tabor a millionaire, but it did not worry Mr. Moffat in the least, and he continued running his business affairs just as carefully as before the profits of his half of this wonderful mine began coming in.

"In those days the telephone was not in practical use. Mr. Moffat wished to talk to Leadville and asked our superintendent if he could let him have an operator to translate the dots and dashes into plain English for a few evenings after our office was closed for the night. As I was the only operator out of the four or five, then employed here, that could not dance, the superintendent instructed me to come around evenings and get Mr. Moffat in touch with his Leadville people. The first evening that we made the connection Mr. Moffat was informed by his Leadville partner that one John Taylor had struck a vein very much resembling that in the Little Pittsburg upon adjoining property, that Taylor was calling it the New Discovery, and which he would sell for $30,000 cash. Would Mr. Moffat buy? No, not until he knew what he was buying. The next evening the electric current brought the information to Mr. Moffat that Taylor had raised his price to $40,000 and that there was some chance that the vein in the New Discovery would crop over into the Little Pittsburg. Would Mr. Moffat accept the raise in price and take the property before it went higher? No, not until he was certain what he was putting his money into.

"The next evening Mr. Moffat received the startling information that a Chicago syndicate was negotiating for the New Discovery, and had an expert upon the ground, and that Taylor had jumped his price another ten thousand. Before Mr. Moffat could be asked if he would go in and take over the new property, he coolly replied, if the Chicago syndicate are surer of what they are buying than we are, let them have it. This new state of ours is in need of eastern capital; and the evening's conversation ended. However, it was renewed the next and the next evening until finally Taylor had the price up to $115,000. By this time Mr. Moffat had the necessary assays made and Mr. Tabor reported $150,000 worth of ore in sight in the New Discovery with the ore body increasing in size. It was then that Mr. Moffat verbally told me to tell Mr. Tabor over the wire that he could offer Taylor $125,000 for the mine, which Taylor accepted—and then tried to spend it all in a month.

"That night, after the sale was closed, Mr. Moffat turned to Mr. George Kassler, his cashier, who had been accompanying him to the telegraph office, and said: 'George, I am glad that we have settled this little deal, so that we both can spend our evenings at home, and I feel better satisfied in paying Taylor $125,000 for his property now than to have purchased it for $30,000 before knowing the extent and value of its ore body.' The newly-acquired property proved a great producer, and up to April, 1880, a little over a year, had netted them exactly $2,697,534.91.

"In my opinion Mr. Moffat is building his railroad after the same cautious and deliberate, businesslike way in which he invested in mines and has since conducted his other business, and when the road is completed and the greatest coal beds and mineral deposits in the state are tapped and when stock can be shipped direct to the markets, instead of being driven eighty to one hundred and fifty miles to the nearest railroad station, then those men who put their money in with Mr. Moffat in this great undertaking will find that his road that has paid from the start will be paying even better when completed and that branches and feeders will be built just as fast as Mr. Moffat's judgment dictates.

"When Mr. Moffat was president of the Denver and Rio Grande Railroad, nearly twenty years ago, the foreign stockholders of that company never hesitated in building a new line that Mr. Moffat saw fit to recommend, and the new lines built under his management have since proved the best paying ones now owned by that great system."—Denver Republican.

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Ben's Initiation.

BY J. P. WILLIAMS.

Hazing the newcomer is an established custom in every railroad despatcher's office and is looked forward to with keen delight by those who have attained the required degree, particularly if the new arrival is from the commercial ranks. Of course, the matter handled by railroad operators is of different character than that which forms the daily work of the so-called commercial telegraph operator. Train orders, freight reports, combinations and abbreviations describing lading manifests, etc., are so numerous that the average telegraph operator in entering the railroad service practically begins a new course in the art of telegraphy.

I have a vivid recollection of the entrance of "Ben" Howard in the service of the Pennsylvania Railroad. Many old railroad operators will remember "F" office, the despatcher's headquarters of the Philadelphia division, on the second floor of the old building in West Philadelphia, at one time the main depot of the Pennsylvania Railroad in that city. Here, at the time of which I write, centered the junction of four divisions, all trains from junction passing in over a four-track road to the new depot at Broad and Market streets, known to all travelers as the Broad Street Station. After entering this section trains were considered to be in the "yard" and were handled by the yardmaster, the train despatchers relinquishing jurisdiction as the train passed a small signal station just east of "F" office and toward Broad street. The train sheets recording the passage of all trains entering this section, however, were required to be kept at "F" and these sheets, broad and important in their aspect, covered an easel-like shelf placed above the two instruments connecting "F" office with the Broad Street Station. These wires were used not to direct the movements of trains, but for the purpose of answering queries relative to the position of trains on the various divisions. This desk the boys always referred to as the "gut" and was the one to which the newcomer was invariably assigned. "Ben" Howard took up his duties on this wire in a rather sulky mood. He had been placed on the roll by Division Operator Fondersmith two days previous, and his experience had been anything but pleasant to him. His probation up to this time had been spent in receiving all sorts of queer messages which, however, seemed to be received and passed up in the regular manner without comment or return. An hour after he had donned his office coat on the first day, he had answered the call for "F" and had received the following message: "To Superintendent Gucker: Please send a 40,000 pound capacity locomotive to load ice." It sounded strange to Ben, but everything in the place was strange. A few more such messages throughout the day increased his misgivings. Ben, however, was on hand at the appointed hour on the second day. Answering a call on the Westchester wire, the instrument ticked off the following:

"To F. F. G.: Barnum's Circus loads at this siding to-morrow. Please send thirty flat cars to load elephants. The giraffes go in Eastman steam-heaters. Do you regard it as necessary to place men on top of the cars to have the animals duck as we approach tunnels? Please reply." This was a bit too much for Ben; he opened his key and looked around the room. All hands seemed to be busily engaged with their respective duties, but a gleeful chuckle revealed the face of "Smiling Sam" Graham, located back of the switchboard, instrument in hand and the "fake" message before him. A general laugh followed, in which Howard, a youth of twenty-two, and really a fine fellow, subsequently becoming an expert railroad operator, seemed to join.

The following morning found the new man assigned to the "gut." It should be explained here that all trains are known to railroad men by other designations than by their schedule number. There is the "Flying Dutchman," "The Limited," "The Cannon Ball," etc. One train on the Pennsylvania Railroad, known far and wide at that time as the "Tub," was an old-timer, having made daily trips from end to end of the Philadelphia division for many years. She stopped at all stations, taking a package here, leaving one there and from the variety and general nature of the contents of her baggage car was called the "tub."

Operator Howard had been on his new assignment about one hour when "Ps," the Broad street office, called "F," and receiving the customary response, inquired, "How's the Tub?" meaning, of course, to inquire whether old No. 16 was on time or how much of the hour late. Howard scowled darkly at the instrument and made no response. A repetition of the inquiry caused a deeper frown and a mental determination to "quit this business and go back to straight stuff." Finally the "Ps" operator reported to the stationmaster his inability to obtain an answer from the man at "F."

The stationmaster, himself an operator, who had graduated from the key, came to the wire and ordered his assistant to repeat the inquiry. He did so.

Ben Howard suddenly threw back the lever of his key, grasped the instrument tightly and with many rapid motions, said things which reflected seriously on the antecedents of the stationmaster, that individual himself, and the road in general. A moment later the telephone bell rang in the superintendent's office, that gentleman hurried to Despatcher Fondersmith, and explanations followed rapidly. Operator Howard was given leave for the day with pay.

Orders, if sent to Telegraph Age, Book Department, for any book required on telegraphy, wireless telegraphy, telephony, electrical subjects, or for any cable code books, will be filled on the day of receipt.

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The Military Telegrapher in the Civil War.

PART IX.

Deviating from the publication of letters written by military telegraphers thirty years and more ago, to Colonel William R. Plum, the historian of the United States Military Telegraph Corps, we break the series temporarily to print the following received from Thomas H. Brooke, of El Reno, Oklahoma, recounting his experiences as a military telegrapher in the Civil War, the writing of which has been stimulated by the letters of like character he has read in these columns:

Early in March, 1863, I reported to Captain Samuel Bruch, superintendent of the United States Military Telegraph Corps, at Louisville, Ky., for duty as an operator. I was sent to Columbia, Ky., where the Ninth Kentucky Cavalry was then encamped. The cavalry was soon withdrawn, leaving me in charge with a lineman and secret service man or spy, to keep up correspondence with the department at Louisville as to movements of General John Morgan. The lineman took up his abode in the country, where he would be least exposed to raiding parties from Morgan's camp. The spy or scout was very daring in his movements. He was employed by a farmer and worked on the farm near Morgan's camp. When occasion afforded he would come to Columbia and pass his report to me secretly, which I usually reported in cipher to the department at Louisville.

It was no unusual thing for George A. Ellsworth, Morgan's operator, to cut in on our line, and for us to find the line cut and twisted around trees in a manner rendering it worthless.

An operator by the name of George Purdon was at Lebanon, Ky., during this period, and he and I had private signals for tests in case of suspicion when any important matter was pending. I would say "sign;" his answer would be "P;" again I would say "sign;" his answer the second time being "N;" once again I would use the word "sign," to which his answer would be "Nodrup." The letters used were the last and first of his name, the final word being his name spelled backwards. His test for me in like manner was: "Sign," "B;" "sign," "E;" "sign," "Ekoorb."

The signals worked like a charm. Mr. Ellsworth cut in, called me up, asked what was latest from Morgan, and signed "P." I said "sign." He responded "P." "Sign," I demanded. He responded "P. You d—— fool, what's the matter with you." We scrapped a little, and he said he was coming after me himself this time and would get me and would make it d—— rough for me. He said the boys that had been after me the two or three times before were no good. I assured him in the name of Uncle Sam that if he ever cut our wire again I would have him sent to "Camp Chase."

Several detachments raided Columbia at intervals after that time. My office was located on the second floor of a building with only a front stairway for exit. When the cavalry would charge into the town I always heard them and usually dared not use the stairs in effecting an escape, as I would meet the enemy at close quarters with a likelihood of being captured, but would climb out of the back window, letting myself down as far as I could reach, then let go and drop to the ground. A six-foot board fence enclosed the back yard. As soon as I could cross the fence I was protected from view and could make good my escape. On one occasion the rebels had reached the front steps just as I left the window. As I was about to vault the fence I was commanded to halt, the order being accompanied by a volley of shots. I scarcely touched hand or foot to that fence, but was over it in an instant and soon reached a clump of timber and underbrush, in which I found a secure hiding-place, although diligent search was made for me. One man, indeed, rode within six feet of me. I looked him square in the face. He had his gun cocked and finger on the trigger, but rode on. I saw others searching closely. Finally they gave it up.

On July 3, 1863, the whole force of the enemy moved into Columbia about noon. I had anticipated the date of their coming pretty closely and was on the alert, and made my escape on a good horse. But my capture was evidently determined upon, and ascertaining the direction I had taken, I was followed closely. A ride of a few miles brought me to the "Devil's Elbow," a point where the road curved around a great canyon in the mountain, following which would bring me back close to the advance of my pursuers. I hesitated whether to chance the shots they would take at me if discovered, as I was almost sure to be, or to leave my horse and take to the woods and so endeavor to get away. My intention was, if possible, to reach Green River bridge, where two Union regiments were stationed, guarding a ford on the road to Lebanon. If I could reach them they would be prepared to meet attack. They could not be communicated with by wire. I determined to take my chances by keeping to the road, and lying as flat on the horse as possible, I urged him to a swift pace. As I reached a clear spot in the road where no timber shielded me from view I was observed, as expected, and a volley of lead was sent after me. Bullets whistled all around me, but, fortunately did not touch either horse or rider. Almost instantly I was again hid from view by the intervening timber. I reached Green River safely and notified the troops of Morgan's approach, with the result that immediate preparations for defense were made. Attack was deferred until the dawn of July 4, but owing to the entrenchments hastily devised and the superior advantages of position, those two regiments were not only enabled to hold their position, but forced Morgan to cross the river to his great disadvantage.

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An advance from Morgan's force, however, succeeded in crossing the river at some point during the night, accompanied by Operator Ellsworth, and a point on the railroad between Lebanon and Louisville was reached. Ellsworth cut in on the wire, and, using the name of Purdon, the operator at Lebanon, invited one of the Louisville operators to come and spend the 4th of July with him and have a good time. The operator boarded a train, later to find his train ditched near Lebanon Junction and himself and passengers robbed of everything of value about their persons, delivered up at the muzzle of loaded guns in the hands of these guerrillas.

After reaching Green River ford July 3, I fully anticipated the capture of our troops stationed there and determined to press on to Lebanon at early dawn of the next day. Accordingly I crossed the river before nightfall and sought lodging in a cabin near the ford. I was made welcome by the inmates, who informed me that they were Union people. They feared to remain, and at once, under the circumstances as explained by me, started for the woods, taking some rations with them, leaving my breakfast and a little bottle of tanzy bitters. I retired for needed rest and slept until awakened by shot and shell and shouts at daybreak. Securing the food left for me, I locked the door and laid the key over the door of the log house as I had been directed, and hastily left for Lebanon. I could not communicate with that point by wire and did not have time to advise regarding the movements of Morgan before leaving Columbia. My hope was to reach Lebanon in advance of the Confederate force.

I reached Lebanon and reported the condition of things to the commanding officer and likewise to the department at Louisville. Reinforcements were ordered from Danville to Lebanon, but through their own negligence failed to reach their destination until after our forces were captured and much of the town burned by Morgan, the attack having been made at daybreak July 5.

Fearing the result of the weak force at Lebanon in an attempt to hold its position, I requested to be passed through our picket lines, which, being granted, by daybreak I had made my way to a high elevation near the city. After it had become light enough I could see every move of the engagement, buildings fired and prisoners killed, until Morgan's force began moving on the Powder River road. I then determined to go to Danville. I had turned over my horse at Lebanon and was afoot. After breakfasting on luscious blackberries picked from the bushes, I hurried on, traveling three or four miles, when I discovered a troop of cavalry camped by the roadside. Approaching carefully, I observed they were all in federal uniform. The soldiers proved to be two regiments of Michigan cavalry, which had been ordered to reinforce Lebanon, and had failed to reach there in time. I told the story of the fate of that town. After my information was given there was a quick mount and an advance made towards the Powder River road. Reaching a high point, Morgan's men could be seen in the distance. The artillery was got in position and a few shells were thrown so close to the retreating raiders as to cause quite a commotion among them and to accelerate their movement. Our men returned to Danville and I with them.

Before leaving Lebanon I said to Operator Purdon that the troops there could not stand against Morgan's heavy force, and I expressed the fear that he would get the worst of it. He said he was pretty good on the run and would chance his luck, as, of course, he must, as everything was then dependent upon him as the only operator in charge. He was a brave boy and deserved much credit, for he narrowly escaped with his life by hiding while his fellows were being murdered at the hands of the guerrillas, who had taken them prisoners.

I was ordered to report to Captain J. C. Van Duzer, superintendent of the United States Military Telegraph at Nashville, Tenn. He stationed me at Murfreesboro, where I had Joseph M. Humphreys, John Chittenden and others as comrades whose names I cannot now recall. I arrived there just after the battle on Stone River and remained until after the Army of the Cumberland had moved to Chattanooga. I was scarcely able for light duty at the time the army moved, and was accordingly sent to Fosterville, where two companies of infantry were doing guard duty. There I remained until November, 1863, when General Joe Wheeler made a raid northward and cut wires to the south of me in a dense pine thicket one or two miles distant. A section foreman discovered the condition of the wire and hurried to the office, saying that horse tracks indicated that a cavalry troop had destroyed the line for half a mile in length. He refused to take his negroes and go back and repair the line so I could report to army headquarters south as to the cavalry movement. The section foreman explained that he was not yet ready to hang on a pine tree, which would be the result if caught repairing the line with "niggers." The gang heard what he said and did not seem to be inclined to go either. I told him that I would take his men and repair the wire and he could remain behind. The men hung back, but after a little cussing from the boss, they got aboard under my charge. When we reached the pine thicket I almost wished I had not ventured. I said: "Men, if you ever worked fast, do it now." They were certainly scared, and I never saw men jump into work so lively. The breaks were repaired and we were soon back and reported Wheeler's army as having moved north at daylight on the pike, which was one mile distant from Fosterville.

(To be continued.)

The practical side of the telegraph is discussed in every issue of Telegraph Age in a manner to interest and aid every individual operator in the service. Why not secure the benefits of such information by subscribing for the paper—$2 a year.

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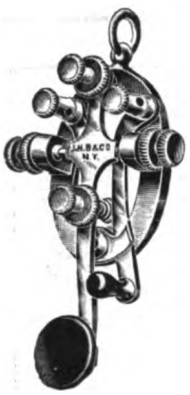

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The Railroad.

Mr. M. E. Launbranch, engineer salesman for the Western Electric Company, New York, for many years past, has resigned to accept the management of the Chicago office, which is located in the Monadnock Building, of the United States Electric Company of New York, manufacturers of the Gill selector.

Mr. H. C. Hope, of St. Paul, Minn, superintendent of telegraph of the Chicago, St. Paul, Minneapolis and Omaha Railway, was a recent New York visitor. Mr. Hope attended the annual meeting of the Railway Signal Association at Washington, D. C., on October 13. Mr. Hope was accompanied by his daughter, Miss Nellie Hope. During his stay in town he called on Thomas A. Edison in company with L. B. Foley, superintendent of telegraph of the Delaware, Lackawanna and Western Railway.

Albert Hayward, aged seventy-seven years, for over thirty years superintendent of telegraph of the Ohio and Mississippi Railroad and its successor, the Baltimore and Ohio Southwestern system, died at Cincinnati, O., on October 5, as a result of a stroke of apoplexy, from which he suffered for over a year. He was a native of Rutland, Vt., where he taught school during his early life and later resumed his profession at Olney, Ill. He studied law in Olney and was later admitted to the bar, but instead of practicing law became a telegraph operator at that point. In 1871 he was appointed superintendent of telegraph for the Ohio and Mississippi, and was continuously in the service of that company and its successor, the Baltimore and Ohio Southwestern, until his retirement, a few years ago.

Annual Meeting of the Railway Signal Association.

The Railway Signal Association with a membership now over eleven hundred, and with forty-three roads represented in the membership officially, is gradually becoming a strong organization, says the Railroad Age Gazette. By the amendments to the constitution, adopted at Washington at the meeting held October 13, 14 and 15, its dignity and usefulness will be increased. The amendment reducing the number of meetings to three in each year, instead of five as hitherto, will promote efficiency by preventing much waste of energy. The annual meeting is on the second Tuesday in October, and there will be one meeting in Chicago on the Monday before the third Tuesday of March, and one in New York on the second Tuesday of May. There was considerable sentiment in favor of having the May meeting come three or four weeks later, and it is possible that the executive committee, which has the necessary power, will change this date. That the specifications for different kinds of signal work, which have been adopted are important, is evidenced by the pronounced demand for them, which continues in spite of admitted deficiencies in most of the codes. The harmonizing of the different codes, which will probably be done this coming year, will no doubt greatly improve all of them. The action of the association in defining signal aspects and simplifying the code of aspects seems destined to greatly improve practice throughout the country, albeit there is a great wall of conservatism yet to be broken through. Hitherto most of the association's good work has been in connection with construction rather than design, with details rather than broad policy; but now it has opportunity to fill a larger and more important field. Under President A. H. Rudd it has made a good beginning toward taking a position of influence with managing officers; and this progress, we may confidently assume, will be kept up. The signal engineers of the country should not only tell their employers how to make and manage their signals, but also should have a more influential voice as to what to adopt, and how fast to turn the wheels of progress.

The association voted to hold the next annual meeting at Louisville, Ky. The election of officers for the ensuing year resulted as follows: President, L. R. Clausen, superintendent of the Chicago and Milwaukee division of the Chicago, Milwaukee and St. Paul Railway, Chicago; second vice-president, C. E. Denney, Lake Shore and Michigan Southern, Cleveland, Ohio; (the first vice-president is H. S. Balliet, New York Central, New York, who holds over); secretary-treasurer, C. C. Rosenberg, Bethlehem, Pa.; members of executive committee, C. C. Anthony, Pennsylvania Railroad, Philadelphia; J. C. Young, Union Pacific, Omaha.

Telephone Despatching on the Canadian Pacific Railway.

A trial telephone despatching circuit was equipped on the Canadian Pacific Railway between Montreal and Farnham, Que., forty-four miles, and put into operation on June 23, since which time no despatching has been done by telegraph between those points with the exception of two occasions when some of the instruments were injured by lightning. Two special hard-drawn copper wires, weighing 210 pounds a mile, were strung. These wires were transposed every quarter mile between Montreal and Montreal Junction, and every half mile for the remainder of the distance. The circuit is now being extended from Farnham to Newport, Vt., sixty-four miles further. It is the intention, says W. J. Camp, the electrical engineer of the Canadian Pacific Railway's Telegraphs, to transpose every half mile between Farnham and Newport, with the exception of a few miles where a high-tension power line is paralleled. Along this portion the wires will be transposed every quarter of a mile. The double transposition insulator is not used, the two wires being usually strung on the end pins of two crossarms, one wire above the other. Where transposition takes places an extra pin is inserted in the upper arm to carry the wire that would otherwise be on the bottom

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arm; the upper wire then drops to the bottom arm on the next pole. By following this method there is no part of the line where the two wires are nearer each other than seven inches, thus avoiding leakage across from wet weather, wet snow, etc., and also liability of crosses resulting from a transposition insulator being broken. The transposition insulator being larger than the remainder on the same pole, the small boy and others are likely to use it as an objective when throwing stones.

The telephone system has been found very satisfactory and, as stated, the circuit is being extended from Farnham to Newport. Estimates have been prepared for two other circuits on western lines, where it will probably be introduced next year. It was at first presumed that while the telephone would likely be found very advantageous in working double track, it would not be nearly so good for single track service, but actual experience has shown that the advantages of the telephone over the telegraph are far greater for single track work than for double track.

Not only is there a very great saving of time in handling traffic, but there are many additional advantages; for instance, the despatcher is able to call the conductor or engineer to the telephone at any station and converse with him directly about any difficulty that may have arisen. He can also get far more definite information in a much shorter time from the operators or agents regarding any matter connected with the despatcher's department. In addition to these advantages, each train can be equipped with an instrument and a jointed pole by which, in case of a train being stalled between stations, the conductor can in one or two minutes get into direct communication with the despatcher. The trains on the Montreal-Farnham section have not yet been equipped, but they probably will be in the near future.—Railway and Marine World.

Some Interesting Statistics Relative to the Association of Railway Telegraph Superintendents.

The convention of the Railway Telegraph Superintendents, held at Montreal, in June last, was so successful a meeting that a few statistics respecting the same will be of interest.

Out of a total of ninety-two active members there were present fifty-five, or sixty per cent. Of thirty-seven associate members there were present twenty-seven, or seventy-three per cent. Of one hundred and twenty-nine paying members (that is, active and associate combined) there were eighty-two present, or nearly sixty-four per cent. This is probably a much better showing than that of any other organization of a similar character, and demonstrates the very great interest taken in the subjects that were brought before the association. In addition to the foregoing enumeration there were present four honorary members and eighty-three visitors, including ladies accompanying the members, making a grand total of two hundred and twelve persons registered.

There were twenty-five active members and eighteen associate members who joined the association at this meeting (eight active and two associate being from Canada), a net gain over the preceding year of seventeen active and twelve associate members. There were three active members elected to honorary membership, and five who lapsed.

Another indication of the business-like character of this organization is the fact that although a trolley ride through the city and around the mountain was provided for, the active members unanimously voted to continue in session and allow the associates to escort the ladies during the afternoon.

Grand Trunk Pacific Telegraph Company.

Few people realize the extent and importance of railway development in Canada. In connection therewith the telegraph is keeping pace—auxiliary agents, each advancing with the other.

The Grand Trunk Pacific Railway Company is constructing a transcontinental railway and telegraph system, extending from the Atlantic to the Pacific Ocean, wholly within Canadian territory, with a total mileage, main line and branches, of approximately 9,000 miles. The western terminus of the road will be at Prince Rupert, British Columbia, where a magnificent harbor is available. Prince Rupert is two days nearer the Orient than any other port on the Pacific Coast. The Grand Trunk Pacific Railway Company is closely allied with the Dominion Government, and the Grand Trunk Railway system of Canada.

The Grand Trunk Pacific Telegraph Company is incorporated under special act of Dominion Parliament, with a capital of $5,000,000. Telegraph construction is now proceeding simultaneously along the entire route, and it is expected that the railway and telegraph systems will be completed from ocean to ocean by 1911. It is also the intention of the telegraph company to extend its system to all points in Canada, where it will prove an active competitor for public business. On September 21, last, the company opened its lines for public service, extending to all offices through the rich fertile provinces of Manitoba, Saskatchewan, and Alberta and further extensions will be made in the very near future.

Chas. M. Hayes is president; Frank W. Morse, vice-president, and A. Bruce Smith, general manager, all of Montreal, Que.

Extravagance.

The following telegraph money order was received by the postmaster of a popular English seaside resort, says St. Martin's Le Grand:

"Pay D. J. V. —— —— four pence. Penny for shave; penny for cigarettes; two pence for entrance to pier."

This is probably a record amount sent by telegraph.

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Train Despatching by Telephone.

BY G. W. DAILEY.

Superintendent of Telegraph of the Chicago and Northwestern Railway Company.

(From the Northwestern Bulletin.)

The yard telephone systems of the Chicago and North Western Railway Company have been in successful existence for years. The errors and misunderstandings have been so few and the operation of these yard lines so successful that it had quite a bearing upon the determination to extend the use of the telephone in our service.

The next step was taken last year, when we equipped the following districts with telephones for blocking trains: Madison Division—Harvard to Elroy, and Milwaukee to Montfort; Wisconsin Division—Milwaukee to Fond du Lac; and Iowa Division—Boone to Missouri Valley. The telegraph block instruments were taken out, telephones installed on the block wires, and all blocking done telephonically since then. It has proved entirely satisfactory in every particular, and it will be noted that these districts embrace both single and double track with heavy traffic. This year we equipped the Madison Division—Janesville to Baraboo (in operation May 31), and the Wisconsin Division—Chicago to Janesville (in operation July 1), with train despatcher's telephone lines, and are now completing line, Baraboo to Winona.

The standard of installation and use is alike on the two divisions, and one illustration or example will cover all. The very best wire, instruments and other material have been used, and the best workmen obtainable to install them. The line is metallic circuit, that is, two copper wires, No. 9 B. & S. gage, weighing 210 pounds per mile, transposed every one-fourth mile to eliminate induction and outside electrical interference. The circuit is self-contained, that is, the signaling and talking is all done on the same pair of wires, and one does not interfere with the other. The calling is done as follows: In the despatcher's office is located a box about twelve inches high, eighteen inches long and three inches deep, with a row of push buttons across its face. Inside the box is a clock and three small relays or magnets, all connected. Each push button corresponds to a certain station. Each station is equipped with a box containing a clock, two relays, two coils, four cells of dry battery and a four-inch vibrating bell, which can be heard a considerable distance, even out on platform. The despatcher desiring, say, four stations, presses the push buttons in his box corresponding to the stations, then presses a battery button in the lower middle face of box, and the bells in these particular stations ring until shut off by the operator. They make such a racket that he is usually prompt in shutting them off and answering. By this method as many as twenty-eight stations can be called in thirty seconds. This calling being practically instantaneous, it can plainly be seen that a great saving in time is effected over the old plan of calling by the telegraph key, when it was a common occurrence to waste from fifteen minutes to an hour, calling one office. If an agent or operator is in the freight room or out on the platform unloading freight, he can hear his bell, and we have had cases where others have heard the bell and called the agent when he was out of hearing. The result is that there is practically no time wasted calling offices, which conserves the time of the despatcher and enables him to utilize such time in other more profitable ways. So much for the calling arrangement.

For talking purposes the train despatcher has a breast transmitter and a cap receiver, which leaves both hands free. Each station is equipped with a swinging arm transmitter, which can be moved into any desired position, and a cap receiver, thus allowing both hands to be perfectly free while using the telephone.

The train despatchers' circuit is for the exclusive use of the despatcher in handling trains, and no other business is transacted over it, except as he may direct. The despatcher is cut in on circuit at all times, but stations are not. It is not necessary for way stations to ring the despatcher; all they need to do is to take down the receiver and pronounce the name of their station. If the line is busy when they take the receiver off, they simply wait until it is clear. Stations desiring to communicate with each other must request the despatcher to call the other offices for them, as they cannot do so themselves. This is so arranged in order to give the despatcher entire control of the use of the line. A secondary circuit has been established for emergency use, by transposing two iron telegraph wires. They, as well as the copper pair, are cut into switchboards at every third or fourth office and equipped with hand-throw switches. If any trouble comes in on the copper pair, for instances, between Barrington and Crystal Lake, the despatcher locating same between these offices directs those two offices to cut in the emergency iron pair at each place. One movement of the switch does this, and the line is again ready for use. When trouble has been cleared the lines are restored to normal. The transposed pair of iron wires are, of course, used for telegraph work when not patched into the copper pair. Even then they can be used either side of the patch. One movement of the switch cuts out both telegraph and telephone at any station, and this is done when leaving the office for any length of time or when closing for the night.

In handling train orders by telephone it should be remembered that all rules and regulations governing train movement remain the same as under the telegraph. No rules or practices have been changed, and everything that has been done is still done, the only difference being that they talk instead of work a telegraph key. The orders as delivered to conductors and engineers are just the

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same in form, appearance and every particular as they have been and are handled exactly the same as heretofore. In issuing a train order, the despatcher, after calling the stations he wants, proceeds with his order in the same form and formula as if by telegraph. The names of all stations, conductors, train and engine numbers and time are first pronounced plainly, then spelled out letter by letter and figures duplicated, naming each figure separately. When speaking the order the despatcher is writing it in his record book, which is quite a material safeguard over the telegraph practice. When he is done speaking he is done writing and ready for the repeating by the operators. This reduces his speed of conversation to his own ability to write it down and also gages the speed for the receiving operator out on the line and does not hurry him unnecessarily. The operators repeat the orders back to the despatcher in the same way, giving "X" acknowledgement, etc., same as ever. All operators concerned listen to each other repeat, thereby checking each other. The despatcher underscores each word and figure in his record book as it is being repeated by each operator. Following are two illustrations of orders; the hyphenated words and figures being spelled out letter by letter. The orders as delivered do not show these spacings or brackets, which are merely used for this illustration:

Example I.

Order No. 49.

To C. & E. No. F-i-f-t-y F-i-v-e (Five Five):

Extra E-l-e-v-e-n S-i-x-t-y S-i-x (Double One Double Six) and No. F-i-f-t-y F-i-v-e (Five Five) Engine S-e-v-e-n (Seven) J-o-n-e-s will meet at Bombay (B-o-m-b-a-y) instead of Bangor (B-a-n-g-o-r).

Example II.

No. T-w-e-n-t-y T-w-o (Double Two) Engine S-e-v-e-n-t-y S-e-v-e-n (Double Seven) S-m-i-t-h will meet No. T-h-i-r-t-y F-i-v-e (Three Five) J-o-n-e-s at Bangor (B-a-n-g-o-r).

In reporting trains to despatcher, (3s) no calling is necessary, the operator merely takes receiver off the hook, speaks the name of their station, and goes ahead with their business; the despatcher being cut in continuously, hears them, gives his acknowledgment, etc., and the transaction is completed. The despatcher writes his order in his record book as he speaks it, and so is all ready for the repeat when he is through speaking. The operators can then talk it back to him as fast as they can do so distinctly and plainly. The result is that counting the time saved in calling and the quicker repetitions we find that orders and 3s are handled about fifty per cent. quicker than by telegraph. This means that the despatcher can dispose of his work that much faster, has more time to figure out movements, meeting points, etc., and can handle a great many more trains on his trick and handle them more promptly, thereby greatly facilitating train movements. It further places the despatcher in closer touch with all the little details of his daily work and in closer touch with his men out on the line.

It has been our observation that there has been a decided improvement in the work and deportment of the men out on the line, due to the fact that the conversations between the despatchers or other employes are of a much more personal character than obtained by telegraph, resulting in closer working relations and more pleasant co-operation. It is more as if they were facing each other and they don't feel like indulging in some of the choice remarks that used to fly over the telegraph wire when someone would lose his temper. A cross-grained man don't feel as brave and cocky when he is talking directly to you. We have had instances where derailments or other accidents have occurred, and the despatcher being able to converse directly with the conductor on the ground and the conductor being able to explain things in his own way, more has been accomplished in ten minutes than could be done by telegraph in an hour under the same conditions.

Each superintendent has a telephone on his desk connected with the despatching line. He can listen in, or talk with any or all his stations at any time. He can himself check up any slackness and keep in personal touch with everything, which was not possible telegraphically, unless the superintendent was a telegrapher, and this is not always the case.

It has opened up an avenue for employment for injured trainmen and other employes, who make first-class block operators or station agents, being experienced and much more desirable and reliable than some strange operator that might come along or some young fellow starting in. It should likewise open up a future avenue for bright young conductors to become train despatchers should they so desire. There are many young conductors who ought to make first-class train despatchers, and under telephone operation it would be a comparatively easy matter for them to do so, as they usually have the necessary experience and all the requirements, except the ability to telegraph. The train despatchers are all enthusiastic over the telephone and appreciate it, as it lightens their many burdens to a considerable extent, and we all known they have burdens enough to carry.

There are many other advantages connected with the use of the telephone for train despatching, and it is decidedly a step in advance in the method of handling trains. More trains can be handled in a given time, prompter movements can be made, emergencies handled and controlled quicker and better. All are placed in closer touch each with the other, and the method is just as safe as the telegraph for such purposes. When telegraph orders were first introduced, the first train and engine men handling them were afraid of them and did not want to use them. Now we would not do without them. It was a great advance over running by smoke and time

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card. * * * The change from telegraph to telephone operation on the two divisions mentioned was made without a hitch. All the officers and men concerned are entitled to a great deal of credit for the willing and efficient manner in which they took hold of the matter.

There is an erroneous impression that the telephone may soon supersede and replace the telegraph entirely. This will not happen in your time or mine. On the two districts equipped, while we are using the telephone for train movement business, we have retained the telegraph for ordinary messages and commercial business, and intend to retain the telegraph for such purposes.

Business Notices.

The Central Electric Company, Chicago, Ill., are distributing new price lists on Columbia low-voltage tungsten miniature lamps for battery service. The introduction of the miniature tungsten lamps is of highest importance to those having occasion to use battery lamps and in anticipation of the demand, the Central Electric Company has accumulated a heavy Chicago stock. These circulars and price lists will be sent to any address upon application.

The Hartman Furniture and Carpet Company, of Chicago, one of the largest concerns in this country selling goods on credit, with an extended mail-order business, has reached this point of magnitude in their dealings largely through the wide distribution of their catalogue No. 55, which is a marvel of completeness. In it are shown hundreds of styles of furniture, carpets, rugs and household furnishings, illustrated from actual photographs, and showing the article just as it is. Rugs and carpets are photographed in the original colorings and patterns. It is the same as seeing the articles in the showroom—makes shopping by mail a delight. This catalogue may be be obtained on application. Address the main store, 223 to 229 Wabash avenue, Chicago, Ill.

The Railroad Supply Company, of Chicago, are inviting attention to their style F lightning arrester. This arrester is designed on the well-known principle that lightning will discharge more readily from points than from flat surfaces, and that the greater the number of points and the smaller the air gap between the points and "ground," the more sure lightning will discharge at this air gap. This instrument has a large carrying capacity and does not introduce resistance or impedance in line. It can be connected in series or multiple with line. It is furnished with or without fuse of any capacity. An accidental or intentional short circuit in the arrester will not interfere with the proper working of signals, telephones, telegraph or other devices, and it may be taken apart for inspection while in service without opening or grounding circuit. It is entirely machine and die made, all parts interchangeable, and is furnished on porcelain or slate bases.

The Kellogg Switchboard and Supply Company, of Chicago, have recently issued a folder describing their new push-button intercommunicating telephone system. Five views showing wall and desk set styles, both open and closed, are given. The illustration shows it to be one of the most compact, private, automatic house systems on the market. Being compact, it is necessarily simple in operation. The accessibility and rigidity of these sets are clearly shown in the illustrations of open views. Both styles, wall and desk sets, are easily handled, and attractive in appearance. They are finished in either oak or mahogany, and do not detract from the appearance of any office or room, because of the high grade of the cabinet work for which all Kellogg apparatus is noted. The desk-set box takes up little room, and can be used either movably or placed in any convenient position on a desk or table. The company will be glad to answer any inquiries and to send these folders to those interested, and will also, if requested, forward original photographs which give accurate views of both styles and sizes.

The Twenty-fifth Anniversary Number of Telegraph Age.

The constant call, frequently preceded by the inquiry of whether they can be furnished, for copies of the splendid silver-covered twenty-fifth anniversary number of Telegraph Age, of January 1, last, impels us to say, and thus save needless correspondence on the subject, that we have a limited supply on hand of papers of that date, possibly two hundred copies. Anticipating the demand, a very large edition was printed which is rapidly becoming exhausted. Of course, when gone it will be out of print. But so long as it lasts we will fill all orders. The price of this particular number is twenty-five cents. The illustrated sketches of the personnel of the telegraph appearing at that time attracted much favorable attention, and have been widely read. Then the illustrated articles giving histories of the Great North Western Telegraph Company, and the Commercial Cable Company, besides a vast amount of interesting telegraphic miscellany, all contributed to arouse an intense interest in the special issue in question. Orders should be addressed to the publisher of this paper.

Obituary.

Nathaniel S. Prime, aged fifty-three years, for twenty-five years assistant cable editor of The Associated Press, New York, died on October 17, at his home in Huntington, L. I.

W. J. Crews, whose death was noted briefly in our previous issue, was for twenty years manager of the Postal Telegraph-Cable Company at Raleigh, N. C., but resigned two months ago on account of ill health. He was fifty years old and was born at Lynchburg, Va. He had served the Western Union and Postal companies as operator and manager at various points in North Carolina and Virginia during his entire lifetime.

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The New Smith Premier Visible Typewriter.

As telegraphers are close friends of the typewriter, the great body of Telegraph Age readers all over the world will be interested in the following description and illustration of a new invention just offered to the public. This is the new Smith Premier typewriter, known as Model No. 10. Experts speak highly of it, and operators who have tried it pronounce upon its beauty, its symmetry and its light, velvety touch. Telegraphers will welcome it as they have welcomed previous Smith Premier models, for the Smith Premier, with its complete keyboard, has always been a popular telegraphers' "mill."

The noticeable feature of the machine is that it combines the well-known Smith Premier characteristic of the complete keyboard with perfectly visible writing. This model presents many new devices in its construction. It has two series of ball-bearing type bars, which are drop-forged, hung on single row, one-eighth-inch balls, with adjusting facilities. The wearing surfaces and bearing balls are of such size, material and hardness that the manufacturers claim these parts

THE NEW SMITH-PREMIER VISIBLE TYPEWRITER.

to be absolutely indestructible. The instrument presents a column finder and paragrapher, a device entirely new in connection with typewriters, and which permits the selection of any one of several columns by simply pressing a key on the keyboard; useful in addressing envelopes, paragraphing correspondence, tabulating or doing work in columns. The carriage, which is gear-driven, without straps or bands, travels on ball bearings. These carriages are interchangeable and as several lengths are made, it is possible for users requiring machines of various capacities to produce their work on one machine. The platen is detachable as in former models, and when removed takes the writing with it. The tilting platen feature is retained, which makes erasure easy at any point on the line of writing without moving the carriage or turning the platen. There are right and left-hand carriage release levers and a swinging marginal rack which can be brought over the platen for convenience in setting the stops.

All operations of the machine excepting the return of the carriage and line spacing, are accomplished from the keyboard, and it is unnecessary for an operator to bend over the machine to perform any of the operations, even that of inserting a new ribbon. The only exposed portion of the ribbon is that in immediate use at the printing point. The ribbon is attached to its spools by means of spring clamps, requiring neither pins nor tapes. The movement of the ribbon is reversed automatically. Bi-chrome ribbons may be used and the color change is controlled by a single key on the keyboard.

The new machine has a back space key on the keyboard by pressure of which the carriage may be set back one space at a time; useful when it is desired to rewrite a character or to insert a character when an erasure has been made. There is a universal line spacer in connection with the variable line spacer, making it possible to write on ruled paper, special forms or at any point on the platen. When this device is used the platen is revolved independently of the ratchet on the head of the platen which fixes the three widths of spacing when the variable line spacer is used. The top plate is so formed that all eraser dust falls to the rear of the machine and away from all mechanism. The top plate is absolutely clear of all mechanism, there being in front of the line of writing at any instant, only that small portion of the ribbon which is in use. The machine is provided with a device so that by a single operation the ribbon mechanism is set for stencil cutting, eliminating the necessity of displacing or removing the ribbon by hand. Machines may be supplied with a decimal tabulator which operates in connection with the column finder. The tabulator keys form the top row of the keyboard. There is provided a carriage controller which retards the movement of the carriage when column finder or tabulator are used and which eliminates shock when the carriage makes long runs down the printing line.

Every part of the machine being made to gage and tested by gage inspection, it is therefore perfectly and actually interchangeable, and the twenty years' manufacturing record of the Smith-Premier Typewriter Company and the hundreds and thousands of its machines that are now in use, is additional guarantee of the excellence of the new product.

This new machine is now on sale at the Smith Premier offices in all important cities, and any reader who is interested in typewriters, or in unusually fine mechanical construction, would do well to inspect this very latest offering.

Mr. C. M. Baker, superintendent of construction of the Postal Telegraph-Cable Company, Chicago, in a recent letter, remarks: "Were it not for Telegraph Age a busy man would not be able to keep in touch with the telegraph world."

Operators will find a fund of practical information in every issue of TELEGRAPH AGE.

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LETTERS FROM OUR AGENTS.

SAN FRANCISCO, WESTERN UNION.

F. H. Morris has been appointed traffic chief and M. B. Brown has been transferred to the overland division as assistant traffic chief. This is a well-earned promotion for Mr. Morris, who has risen from a messenger to the position he now holds, solely upon merit and energy.

Recent resignations include: J. W. Whitely, who has accepted a position at Boise City, Idaho. J. Del Buono has been transferred to Tonopah, Nev., to relieve Operator E. E. Spawr, who has been promoted to the position of manager at that point, vice J. L. Morris, transferred to the Goldfield, Nev., managership.

R. Foster has gone to Arizona, having accepted a position for the winter with the Southern Pacific near Tucson.

P. S. Sullivan has been transferred to Goldfield, Nev., to relieve Operator Stevenson, who returns to Los Angeles, Cal.

C. E. Senseman has returned East, presumably to North Carolina.

Among the recent appointments are: Stanley Allen, J. W. Goenner, A. A. Marlatt, H. J. Thompson and H. Newlander.

Business has shown a decided improvement in the last three months, and it can be safely predicted that in the near future this office will be as busy as in the days before the fire of two years ago. Should the wandering operator return to 'Frisco after a sojourn elsewhere since the fire, a surprise would greet him in the view of the wonderful restoration and reconstruction work that has been so admirably carried out. The newer 'Frisco promises to be more beautiful than before her misfortune.

PHILADELPHIA, WESTERN UNION.

Mr. J. A. Thomas, for many years a very successful and popular manager for this company at Pittston, Pa., has assumed the managership of an important branch office in this city, that at Broad street and Columbia avenue, relieving Harry Hallman, transferred to the main office.

Mr. Thomas is one of the old school operators, well trained and seasoned, and adds greatly to Manager J. W. Reed's staff of city branch office managers.

Mr. George McCoy, from Carlisle, Pa., succeeds Mr. Carney as manager of the Kensington avenue and Lehigh avenue branch office. Mr. Carney goes to the main office.

The Barclay system which, by the way, has reached a state of perfection here, is one of the show places in the office. Visitors are amazed at its almost human action and the scope of its wonderful work. Several hundred students accompanied by their professors, from the Pennsylvania State College, were recent visitors.

PHILADELPHIA, POSTAL.

A change has been made in this office, which seems to have pleased all concerned, and that is the moving of the Rowland machines from the dark corner of the room over to the window side. This will eliminate the use of artificial light, which it was necessary to employ all day long.

Another improvement in this office was the altering of the position of the electric lights. Heretofore there were clusters of lights hung all along the center of the room. These were changed to lights hung a little lower and with extension arms reaching over the center of the desks. This rearrangement will distribute the light much better.

Mr. B. H. Moore, of the manager's office has resigned to enter other business.

Mr. Albert Zintl, formerly manager of the cotton district office, Front and Chestnut streets, has been appointed assistant manager at the main office.

Mr. Philip Riley, former manager of the office in the Arcade Building, Fifteenth and Market streets, has been appointed to succeed Mr. Zintl in the cotton district, and Mr. H. B. Given, formerly an operator in the main office, takes Mr. Riley's place in the Arcade Building.

NEW YORK, WESTERN UNION.

Robert C. Rattray, formerly of the operating department, died lately at Concord, Mass. While he had been ailing, his death was unexpected, and the news of his passing away will shock a host of friends. Mr. Rattray was a telegrapher of rare ability and well known throughout the United States and Canada.

Sympathy is expressed for Mr. T. P. Hale, chief of the underground system, because of the death of his daughter, Mrs. Blanche Boschen, which occurred at her home, Irvington, N. J., on Friday, October 16.

OTHER NEW YORK NEWS.

The annual entertainment and reception of the New York Telegraphers' Aid Society, in behalf of the relief fund, will take place in the Lexington Avenue Opera House and Terrace Garden, on Tuesday evening, November 10. Mr. R. J. Marrin, chairman of the entertainment committee, states that the programme will be of a very high class and under the immediate direction of Mr. George Leveene, a gentleman who has displayed much ability in staging the productions of the society for many years. The well-known musician, Professor M. J. Ryan, leader of Squadron "A" band, has again been secured for the musical portion of the entertainment. Judging from the advance sale of tickets and the unusual demand for private boxes, it has been anticipated that there will be a large attendance, presaging success, and the realization of a substantial addition to the relief fund. The entertainment committee is made up as follows: R. C. McDonald, George Leveene, W. H. Mathews, H. C. Worthen, R. J. Murphy, W. J. Quinn, J. J. Scanlin, J. H. Driscoll,

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C. D. Correll, John Roe, J. A. Henneberry, A. M. Lewis, H. Zweifel, Jr., E. C. Cremins, W. W. Price, F. J. Sheridan, J. F. King, J. F. Zeiss, W. E. Cardwell, T. E. Fleming, J. M. Shay, F. L. Catlin, J. J. Riley, J. A. McNulty, N. J. Crean, R. H. Corson, F. A. Pirie, J. F. E. Hopkins and J. P. Clolery.

Mr. Max Handler, agent of the Gold and Stock Telegraph Company, at Cleveland, O., is on a vacation, the first that he has taken in years, and is making quite an extended journey, including in its itinerary visits to New Orleans and New York, meeting and being entertained by many old friends in both cities.

Stick to Facts.

The demagogue in politics comes unmistakably to the front in a time of a great national election contest like that of the present. A Michigan Congressman is seeking re-election, a right undeniably his, and as he hails from a district in which his party is in the majority, he doubtless will be returned to the National Legislature. What we take exception to is the fact that this aspirant for Congressional honor in his canvass seeks to make it appear that the telegraph as such should be considered a factor in the campaign. He assumes to pose as an authority and critic respecting the telegraph, giving utterance to statements wholly at variance with facts, a proper understanding of which he either will not or cannot comprehend. If he could only be brought to realize how utterly silly and misleading some of his grandiose remarks are, the sixth Congressional district of Michigan might be the gainer, and certainly the halls of Congress, where at least intelligent criticism should be heard, would derive benefit from saner thought.

A member of the telegraph profession in Chicago, Ill., has been charged with fraud in having filed six petitions in bankruptcy within nine years. He is accused of being a professional bankrupt and of making a specialty of preying on money lenders. It is asserted that he charged his friends a fee to show them how they could borrow to the limit of their credit and then have the debts wiped out by instituting bankruptcy proceedings. He is also charged with going to certain money lenders and threatening to induce all their customers to start bankruptcy proceedings unless he received a regular salary from the money lenders.

The Standard Oil Company is laying another pipe line from Indiana and Ohio to Jersey City, N. J. The telegraph wires will follow the pipe line for the purpose of connecting telegraphically the pumping stations which are usually located about thirty or forty miles apart. The length of the line will be about seven hundred miles.

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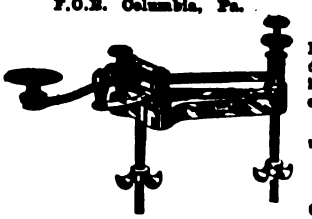

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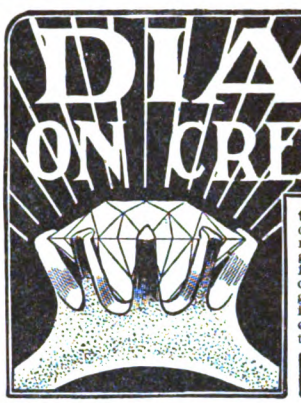

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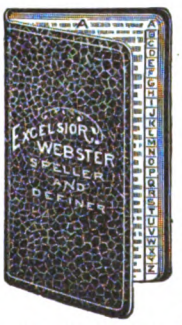

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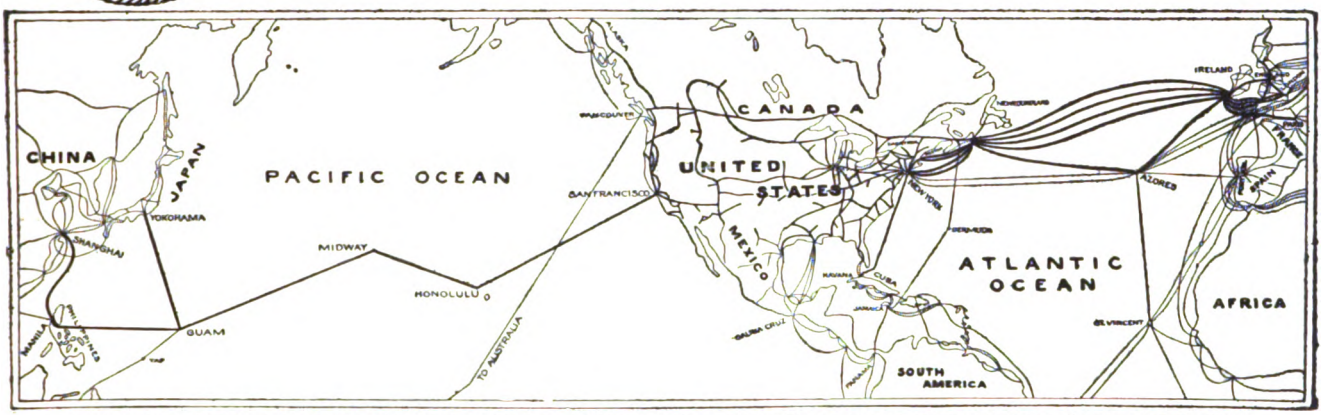

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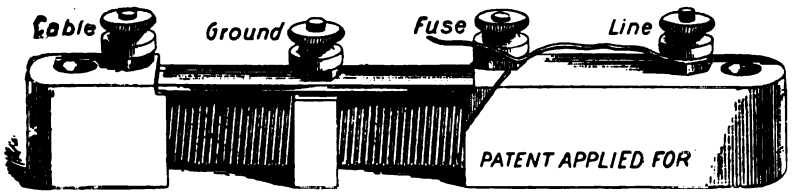

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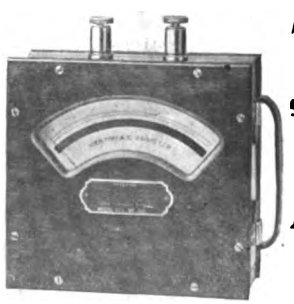

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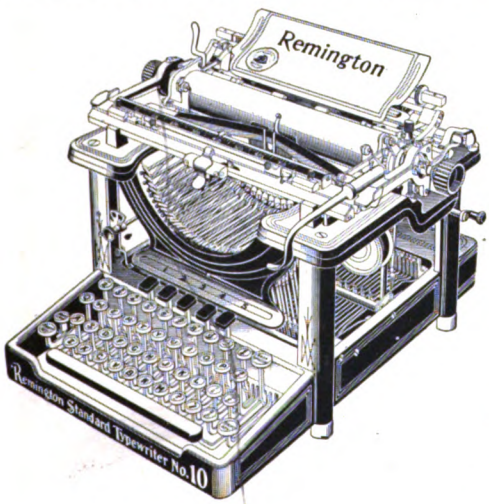

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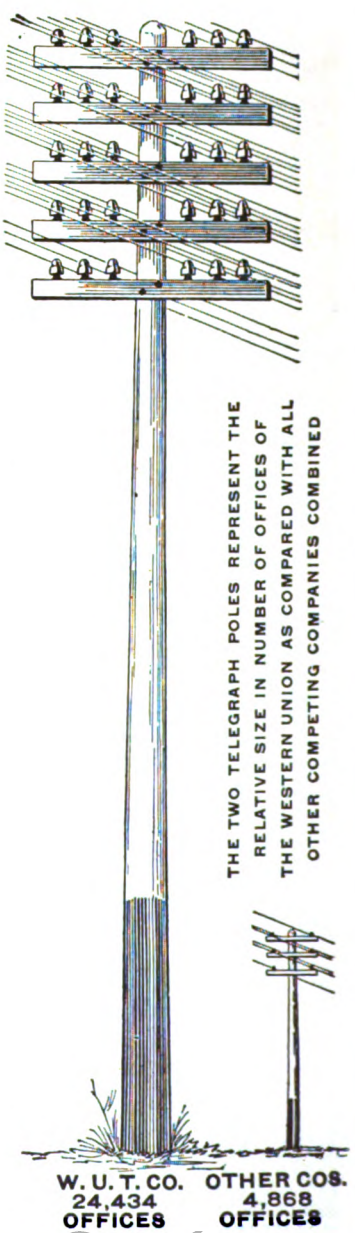

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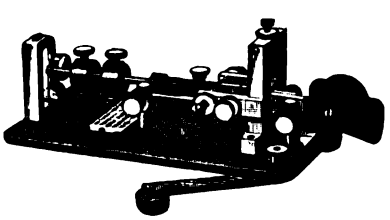

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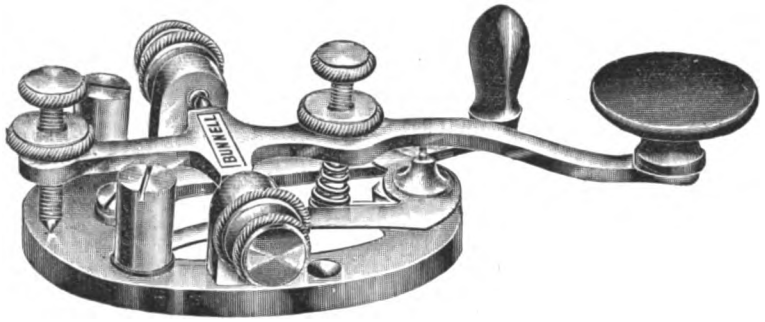

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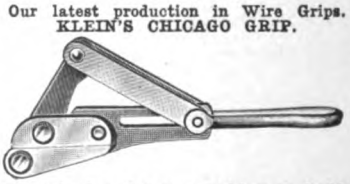

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Elementary Lessons on the Operation of Repeaters.

(PART II.)

In the preceding installment of this article the first practical method invented for automatically repeating the signals made in one wire into that of another was shown in the illustration of the Wood button repeater. This arrangement, however, possessed the disadvantage of not only being unable to permit operators in the second wire to break without a change in the connections at the repeater station being first made, but it required the constant presence of an operator at the repeater to listen and make the change, viz.: turn a switch lever.

The next step in the development of the repeater was to devise a means of automatically performing the work of the attendant. Different inventors employed different methods, but their respective efforts were all directed toward harnessing the repeating points or lever of one repeating relay in such a manner that they could not interfere while the companion relay contact points were in control of the circuit. Hence in studying the operation of different types of repeaters the distinguishing feature of each will be found by observing closely the manner in which this one common aim is accomplished.

Among the first practical automatic repeaters that required no attendant to reverse the direction of repetition was that known as the Milliken repeater, the invention of George F. Milliken, of Boston. In this arrangement an extra magnet in a local circuit and a strong retractile spring do the work without human aid.

Figure 1 shows the manner in which the extra magnet operates. It is placed above the relay coils in the position shown in order that its inverted lever may rest against the lever of the main line relay. The retractile spring of the extra magnet is purposely given a tension that is stronger than that of the relay spring in order that the relay lever may not fall back or "open" when the line wire opens at such times as it is

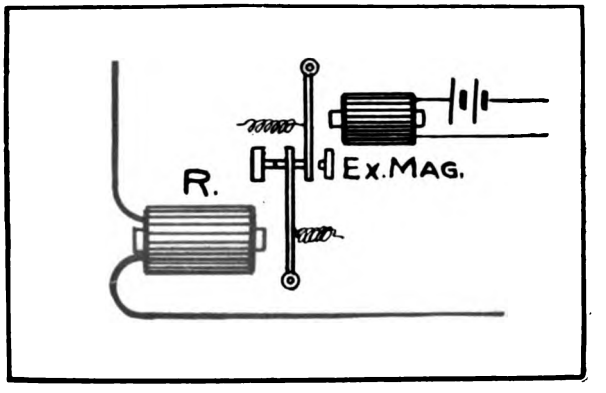

FIG. 1.

necessary to keep the said points closed, while the strength of the extra magnet itself is made so great that it is able to overcome its own retractile spring and thus remove the extra magnet lever when the relay lever should be free to fall back during its legitimate operation.

This extra magnet is controlled by the repeating apparatus in the other half of the set, not shown, however, in the diagram. The effect is the same as that accomplished by the button repeater inasmuch as it prevents one relay from acting as a repeater while the other is in operation. As the same arrangement exists in each half of the repeater set it is not necessary to first reverse any connections before a receiver can break. It repeats in either direction without further attention.

In the Toye repeater, quite extensively used at one time, the contact points of the relay which should remain inactive while the other is in operation, is kept closed by preventing the relay core

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from becoming demagnetized. This is accomplished by providing another circuit for the battery at the instant the line opens. This causes the current to still flow through the relay in the other wire and obviously holds the lever in its closed position.

Figure 2, which shows the full connections in order that the student may see how transmitters

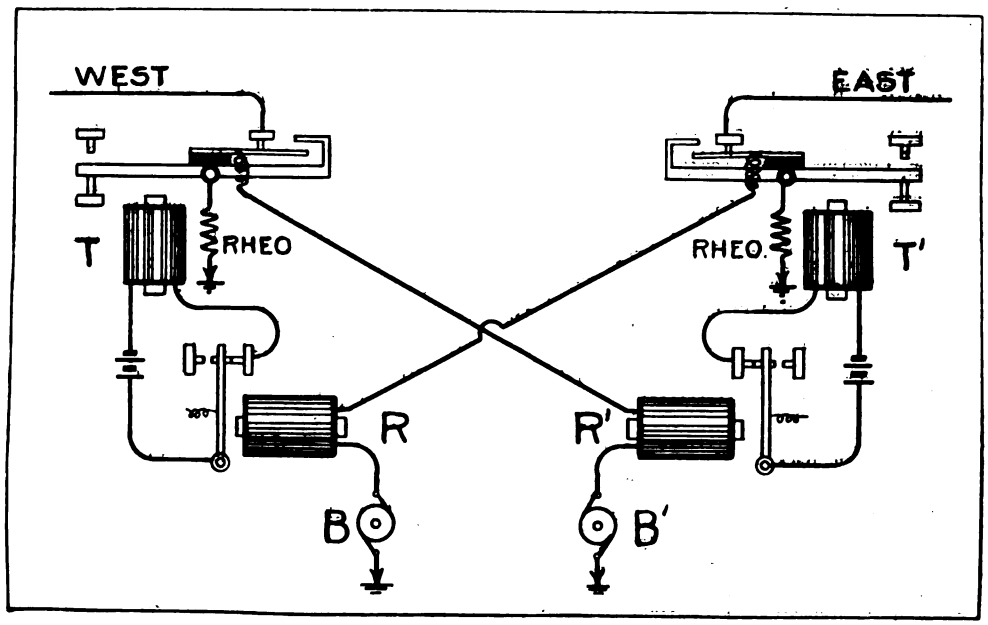

FIG. 2.

controlled by the relays really do the work in actual practice, indicates how this is done. We will suppose the western circuit opened. In this case relay R' would open and thus cause transmitter T' to open. As the battery B which supplies current to the eastern circuit also traverses the coils of relay R, the resulting opening of this eastern wire at the contact points of transmitter T' would demagnetize relay R, and at the contact

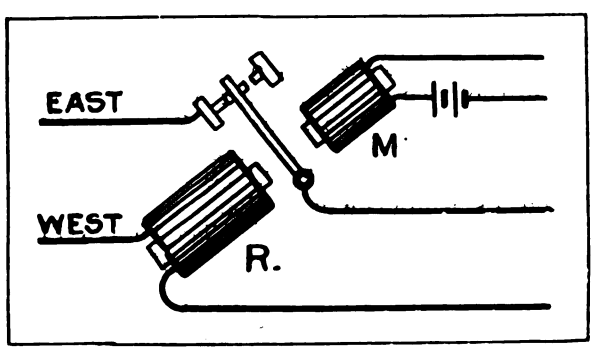

FIG. 3.

points of the other transmitter open battery B' also. In order to prevent this opening an artificial line in the form of a rheostat is connected to the lever bar of the transmitter so that when transmitter T' does open, the current flowing through relay R simply shifts its course from the eastern wire to the rheostat, and relay R remains quiet. Similar action occurs when the eastern wire opens, but in this event it is relay R' that remains closed. One disadvantage the Toye repeater possesses is that the battery is constantly supplying current whether the main line wire itself is open or closed. In other types the current is saved during each second of time the circuit is open. But with the Toye the rheostat absorbs it during the idle moments of the lines. Before the dynamo supplied currents for telegraph circuits this double drain on chemical batteries was a serious matter. Aside from this fault the Toye is one of the easiest handled and most efficient repeaters ever invented. The amount of resistance inserted in the rheostat is generally made about the same as that of the line, but it is not necessary to be particularly accurate about that matter. The point is to give the artificial line a resistance value that will cause enough current to remain in the relay coils when it shifts in that direction, to hold the armature closed.

THE HORTON REPEATER.

Figure 3 shows the distinguishing feature of the Horton repeater. In this device the contact points of one relay remain closed, when its core becomes demagnetized, through the influence of gravity, as the lever possesses no retractile spring to lift it from its normal position on the front-stop, on which it rests by virtue of its own weight.

As may be seen in the diagram the magnet coils are not set level on the base as in other types. One end is purposely raised higher than the other in order to give the said lever the necessary angle or inclination to take advantage of the force of gravity. As there is no retractile spring on the relay and it is necessary that the lever should open and close in the usual way when required to repeat signals into the other circuit, the extra magnet M in a local circuit con-

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trolled by the companion relay and repeating points, perform the duties of the said spring. At such times as the lever should fall back, but cannot without aid, the local circuit containing magnet M closes and the latter attracts the lever in the same direction that a spring would have forced it; that is to say, in an open position. When the line closes again the consequent opening of the local circuit demagnetizes the extra magnet M and allows the lever to fall "closed" again through both gravity and the magnetic attraction of the relay itself.

(To be continued.)

The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part XI.)

THE RECEIVING APPARATUS.

(In the November 1 installment of this series, Fig. 30 was inadvertently referred to as a "multiple" instead of as a "series" arrangement of relay winding. The "multiple" method is illustrated in Fig. 33 of the present issue.)

For the reception of the signaling impulses transmitted over the main line, a polarized relay of the particular type illustrated in Figs. 31 and 32* is employed at the receiving station. This relay possesses the merit of having a very low

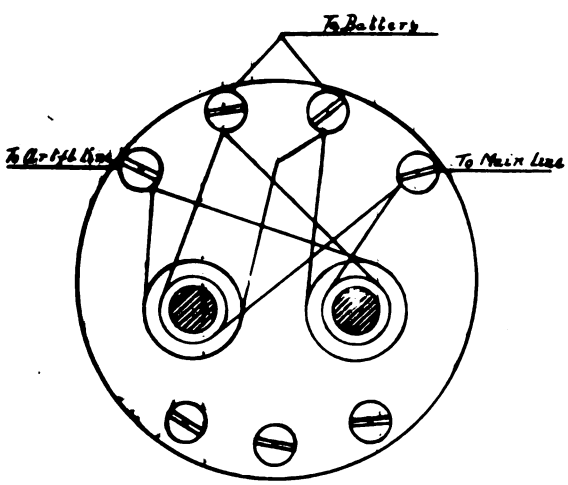

FIG. 33.—DIFFERENTIAL COILS IN "MULTIPLE."

"time constant," the design and construction of the instrument being such as to render it highly susceptible to the very first impulses of the received current. Not only are its moving parts made quite light and nicely balanced, in order to minimize the effects of mechanical inertia, but the magnetic inertia of the electro-magnet itself has been greatly diminished by introducing additional air gaps in the path of the magnetic lines of force. This is effected by suppressing the iron bar, or yoke, ordinarily connecting the two limbs of the magnet core, an arrangement that permits the latter to receive and part with its magnetism much more promptly than would otherwise be the case. For, it should be understood, that in rapid telegraphy we are not so much concerned about the total amount of magnetism that any given current will develop in the receiving apparatus as that it should quickly rise to that smaller portion of its final value at which the apparatus begins to respond.

The parallel or "multiple" method of winding the relay, as shown in Fig. 33, still further re-

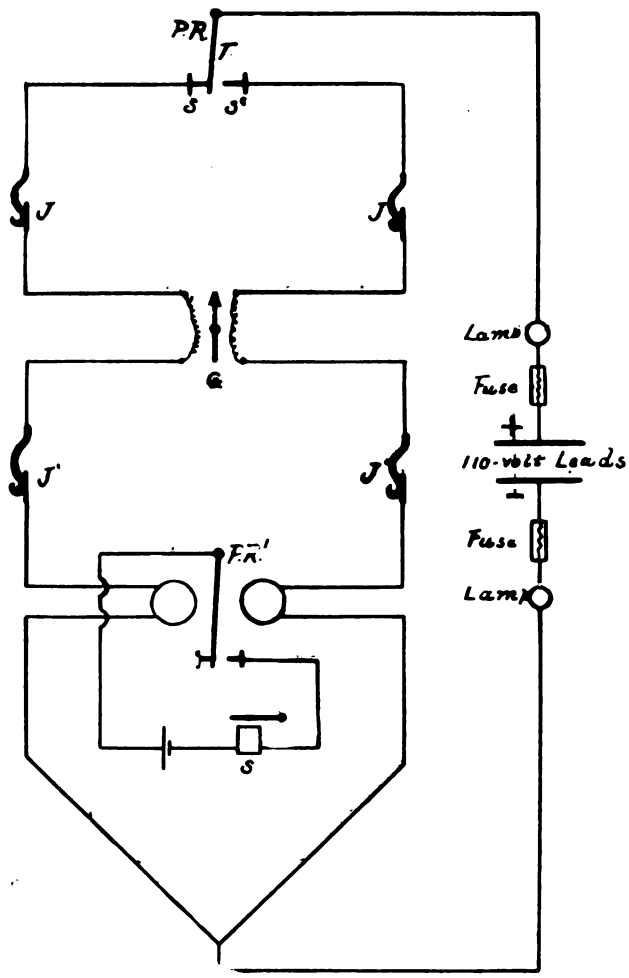

FIG. 34.—THEORETICAL ARRANGEMENT OF LOCAL CIRCUIT REPRESENTED IN DETAIL IN FIG. 35.

duces the "time constant" of the instrument by allowing the current traversing its coils to attain a certain strength (about two-thirds of its full value) in a shorter period of time than if the windings were connected in "series" as represented in Fig. 30, shown in the issue of November 1 (see explanatory correction at head of this article).

With the exception of a galvanometer, this relay is the only instrument in the main line at the receiving end of the circuit, and the signals reaching that point, before becoming translated into readable characters, are first repeated by the relay into a set of local apparatus comprising a galvanometer G (Fig. 35) for detecting local "bias," and a polar relay PR^1 for operating the local

* See November 1 issue of Telegraph Age.

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sounders S and S'. In addition thereto a "printer" relay (which directly or indirectly controls all of the printing appliances) is "jacked in" at J as soon as the circuit is ready for business, while a illustrated in Fig. 34, from which it will be seen that as the tongue T of main line relay PR vibrates between the contact stops S.S' in obedience to the line impulses, a positive current from the

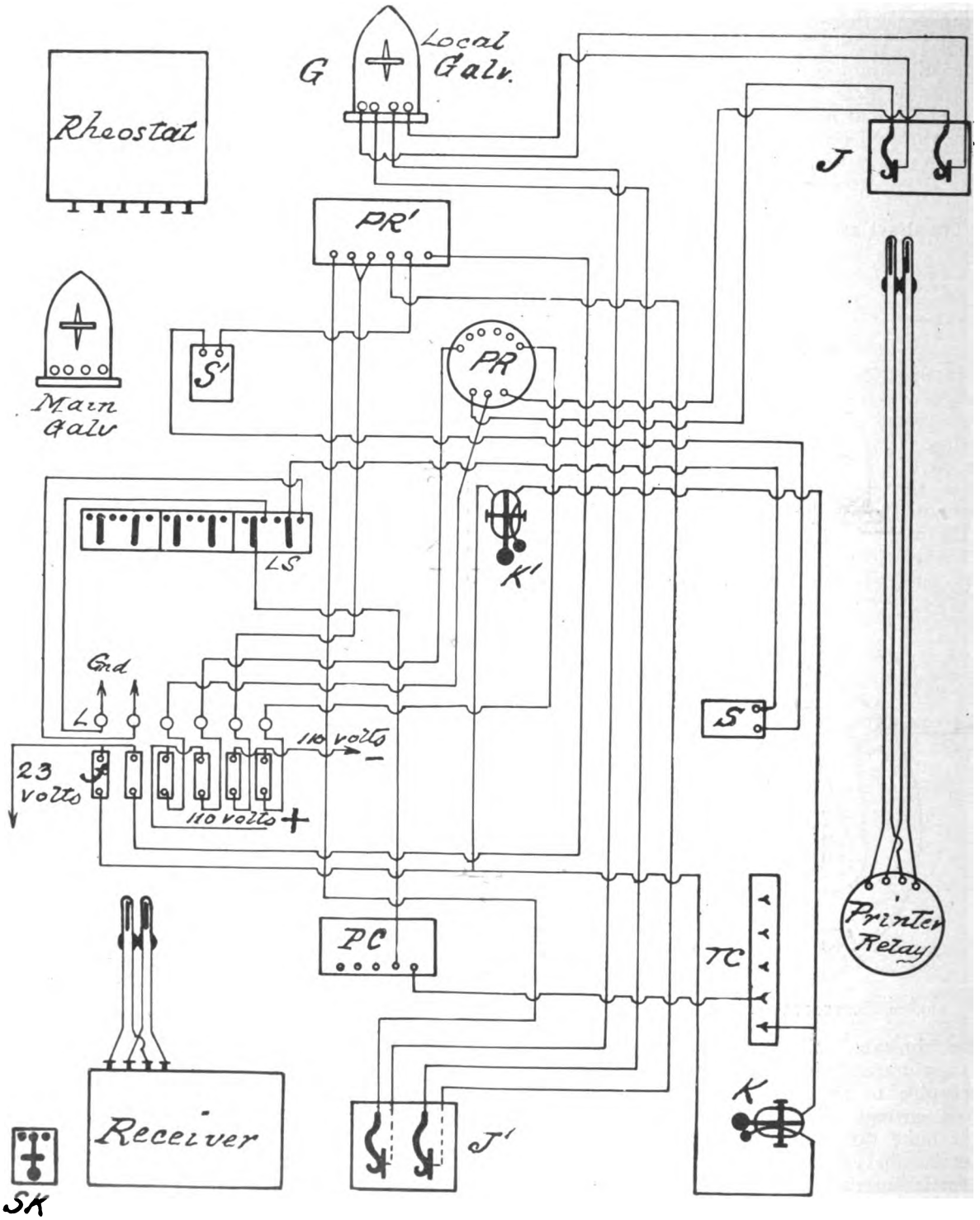

FIG. 35.—BARCLAY PRINTER: LOCAL CONNECTIONS, BALANCING SET.

Wheatstone receiver is similarly inserted at J' whenever occasion requires its presence in the circuit.

The theoretical arrangement of this circuit is

110-volt electric light lead is alternately caused to flow through first one and then the other of the instrument coils connected with said stops; the result so far as the apparatus is concerned be-

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ing similar to that of transmitting currents of reverse polarities through them.

The actual connections of the apparatus may be traced by reference to Fig. 35, which shows the standard method of wiring and connecting up both the sending and receiving local apparatus. In this figure the main line relay is seen at PR, while PR' represents another polar relay for actuating the two local sounders S and S', one of which is placed on the printer table and the other near the "balancing" set. The "printer" relay and Wheatstone receiver with wedge attachments for insertion into their respective spring-jacks J and J', are plainly shown, as is also the local galvanometer G, the particular function of which is to indicate by the deflection of its needle (when the distant transmitter is running free of slip) whether any "bias" develops in the local circuit so that it may be removed by suitable adjustments of the main line relay PR.

The local circuit on the sending side may be traced as follows: From the 23-volt lead shown on extreme left-hand side of diagram, through nearest fuse block f to key K, thence to transmitter clip TC, polechanger PC, local switch LS, and lamp L to ground. A second key K', for operating the polechanger PC, is situated near the "balancing" set as a matter of convenience.

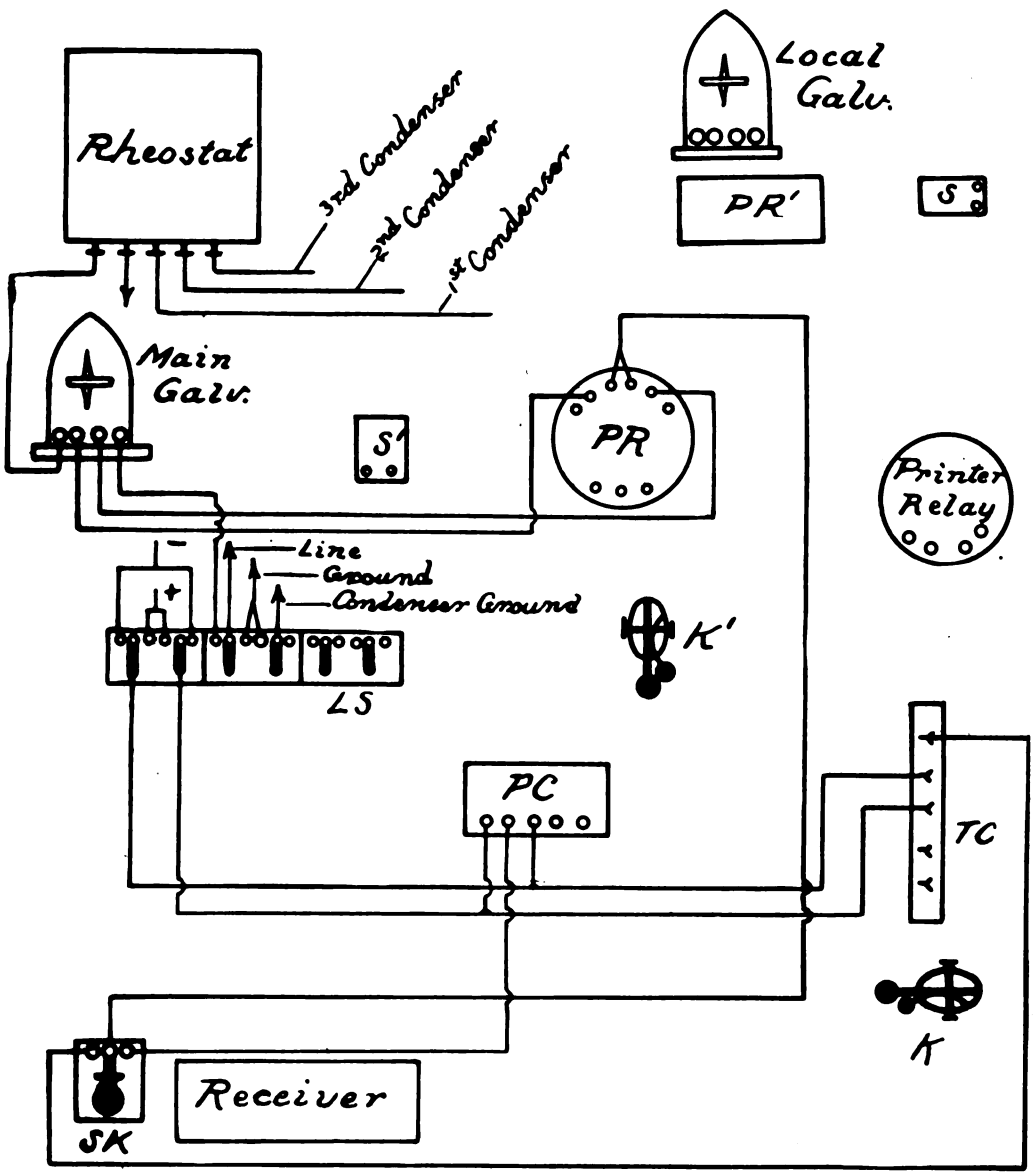

FIG. 36.—BARCLAY PRINTER: MAIN CONNECTIONS, BALANCING SET.

The regular wiring arrangements and method of joining up the main and artificial line apparatus are distinctly shown in the working diagram, Fig. 36, which requires no explanation further than to say that the purpose of the strap key SK is to afford a convenient and reliable means of trans-

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ferring the main line from the transmitter to the polechanger, the latter of which can then be operated from the balancing table and thus facilitate the work of balancing, etc.

(To be Continued.)

Recent Telegraph Patents.

Mr. S. H. Tyson of Zanesville, O., has been granted a patent for a telegraph pole. The pole has a concrete base seven feet high, which will rest in the ground. Five steel rods extend upward from this base. A crossbar for the wires is at the top. Mr. Tyson says the invention can be made to sell at as low a price as cedar poles now bring, and that when painted from time to time it will last without limit.

A patent, No. 901,372, for telegraphy, has been granted to Louis M. Potts, of Baltimore, Md. The method of balancing a plurality of electric circuits, which consists in separately indicating the relative effects of the different constants of the circuits and changing the values of said constants until a balance of each is indicated.

A patent, No. 901,861, for a telegraphic sounder, has been issued to Vincent C. De Ybarrondo, of Los Angeles, Cal. A sounder for telegraphic systems having means adapted to be substituted for the gong of an electric bell, whereby the hammer can be used for giving the sounds.

A patent, No. 901,957, for a telegraphic code condenser, has been awarded to Matthew B. Dickie, of Glasgow, Scotland. Three circular scales are arranged parallel and have different numbers and letters.

The following patents have expired:

Patent No. 461,470, for a telautograph, held by E. Gray, of Highland Park, Ill.

Patent No. 461,471, for an art of telegraphy, held by E. Gray, of Highland Park, Ill.

Patent No. 461,472, for an art of and apparatus for telautographic communication, held by E. Gray, of Highland Park, Ill.

Patents Nos. 461,473 and 461,474, for a telautograph, held by E. Gray, of Highland Park, Ill.

Personal.

Mr. Darwin Z. Curtis, a well-known telegrapher, at present Detroit representative of the Hearst News Service, was elected at the late election to the Michigan State Legislature.

Mr. N. De Bree, for many years manager of the Postal Telegraph-Cable Company at Toledo, O., and a member of the United States Military Telegraph Corps, is now located at Santa Cruz, Cal.

Mr. G. W. Blanchard, formerly and for many years superintendent of the Postal Telegraph-Cable Company, New York, and for the past two years engaged in the real estate business in this city, has returned from Mt. Clemens, Mich., where he has been sojourning lately for the benefit of his health, much improved physically.

Mr. David Homer Bates, secretary of the Society of the United States Military Telegraph Corps, and the author of "Lincoln in the Telegraph Office," will deliver a lecture bearing the title of his book, at the Fourth Presbyterian Church, New York, on the evening of November 16.

Mr. Bertram M. Downs, who for so long a time has served as its general manager, has been elected vice-president of the Brookfield Glass Company, manufacturers of telegraph insulators, whose offices are in the United States Express Building, New York. Mr. Downs is well known in telegraph circles and is a vice-president of the Magnetic Club, of New York.

Mr. William H. Baker, formerly vice-president and general manager of the Postal Telegraph-Cable Company, New York, has become identified with the telephone, joining forces with the American Telephone and Telegraph Company, with offices at 15 Dey street, New York. Mr. Baker's services in this new field of endeavor should be of peculiar value, inasmuch as it introduces an accomplished telegraph executive, of wide experience, into a business in many ways so closely analagous to that in which he has been engaged. Mr. Baker at fifty-three years of age, with splendid health, is in the prime of life and should constitute a forceful personality in the interests with which he is now associated.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

Mr. Belvidere Brooks, general superintendent; A. G. Saylor, assistant general superintendent; D. Roth, superintendent of construction, and W. N. Fashbaugh, electrician of the Eastern division, are making a tour of inspection of the offices between New York, Washington, Pittsburg and Buffalo.

At no previous time in its history has the praise of the company been more eloquently heard than that uttered in behalf of the superb service it rendered election night. Not only were the bulletins handled heavy in themselves, but the expedition of movement surprised even old-timers. Everybody was in excellent spirits and the Western Union easily met the responsibilities put upon it.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

President Clarence H. Mackay entertained about fifty of his personal friends in his private office, which was handsomely decorated, on election night. A large map of the United States was mounted in the office, each State having inserted in it a bullseye lens. These lenses were brilliantly illuminated by lamps placed at the rear of the map. At each side of the map were lists showing the electoral votes of the various States,

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and the States in which Governors were to be elected. Opposite the name of each State bullseyes similar to those upon the map were placed. As the returns came in colored lenses were substituted for the clear lenses in the bullseyes, the different colors indicating the result in the State so marked, thus all the Republican States showed red and the Democratic green, etc. Mr. Mackay's guests were thus enabled to see at a glance how the election was going both generally and in detail, and the interest they displayed in this method of keeping track of the election showed that it was very effective and satisfactory. A regulation quartette table equipped with a complete outfit of resonators, typewriters, etc., was used in this connection and special blanks were printed.

Mr. Mackay presented each of his guests with a souvenir miniature sounder suitably engraved commemorative of the unique occasion.

The officials of the company, all of whom were on hand on the night of the election, were also well satisfied with the service rendered, and speak in terms of high praise of the energy, loyalty and enterprise displayed by the Postal forces everywhere.

At a meeting of the trustees of The Mackay Companies held November 5, H. V. Meredith, of the Bank of Montreal, Montreal, Que., was elected a trustee. In view of the large holdings of Mackay Companies' shares, preferred and common, held throughout Canada, it was felt that Montreal should be represented on the Board of Trustees. The Mackay Companies have now two representatives in Canada, Mr. Meredith and Mr. R. A. Smith, of the firm of Osler and Hammond, Toronto.

Dr. Osuke Asano, chief electrician to the Imperial Department of Communications, Tokyo, Japan, was a recent visitor at the office of Minor M. Davis, electrical engineer. Dr. Asano is in this country for the purpose of examining the telegraph systems for the benefit of his Government.

This company has moved into a new and up-to-date office at Mobile, Ala.

The dynamo equipment of the Montgomery, Ala., office has been rearranged to facilitate the service at that point.

The operating room and business office at Augusta, Ga., were moved November 10 to the new quarters already mentioned in these columns. The Augusta office is now one of the best-equipped in the Southern division.

The Coming Dinner of the Magnetic Club.

The annual dinner of the Magnetic Club, of which extended notice was made in the October 16 issue, will take place at the Hotel St. Denis, Broadway and Eleventh street, New York, on Wednesday evening, November 18, the hour appointed being half-past six o'clock. This dinner, it will be remembered, will celebrate the twentieth anniversary of this well-known club, and in consequence it promises to be a highly enjoyable affair, for which considerable preparation has been made. It is expected that a large company will sit down to the tables, among whom there will be a number of visiting delegates in town to attend the annual meeting of the Telegraphers' Mutual Benefit Association, besides other guests. There will be some good speaking and some good music, both of which it may be said wait upon good digestion.

The Cable.

Cable communication was interrupted November 12 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Macao	Aug. 29, 1908

Messages can be mailed from Hongkong.

The recent appointment of H. S. Baxendale as manager and secretary of the Pacific Cable Board at London, vice C. H. Reynolds, general manager, deceased, advances to high executive office a man who has risen in the telegraph service from the ranks. Mr. Baxendale entered the cable service as an operator in the employ of the Eastern Extension Telegraph Company and was sent out to Singapore about twenty years ago, subsequently joining the British Administration of Posts and Telegraphs in the Malay States.

The Telegraph in Holland.

From statistics just at hand, it appears that the telegraph system of Holland during the year 1906 attained a total of 7,054 kilometers of line, and 33,340 kilometers of wire; 3,526 and 1,160 meters of underground line were laid in iron and asphalt conduits respectively, while underground cables attained a length of 278,828 meters; and sub-river and marine cables, 250,035 meters. The increase in the latter figures is 30,723 and 11,477 respectively. Interruptions of the service numbered 4,864, as against 5,010 in 1905. The offices totalled 1,241, being an increase over 1905 of 29. Of these the state owned 273 telegraph and 614 telephone offices, and 7 semaphonic stations, and 347 were owned by private interests. There were in use six hundred and seventy-seven Morse, one hundred and forty-three Hughes, four Baudot and four hundred and forty-six speaking instruments. The inland traffic decreased by one and two-tenths per cent. in comparison with the previous year, and totalled 3,072,166 telegrams. The average number of words per telegram was 14.70. The international traffic amounted to 3,190,042 telegrams. The figures for the wireless telegraph service are interesting; 475 radio-telegrams were despatched to inland places, and 1,859 to international places, while the numbers of messages received were fifty-four and twenty-four, respectively.

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The Western Electric Company.

The directory of the Western Electric Company has undergone some very important changes in its executive staff. Enos M. Barton, president, an old-time telegrapher, after nearly forty years in the service of the company, has retired and has become chairman of the board of directors. Mr. H. B. Thayer, the head of the New York interests of the concern, succeeds to the presidency, and will continue to make his home in the metropolis. It was officially announced at the meeting of the directors that the company was engaged in consolidating its manufacturing business at its Hawthorne plant in Chicago. It is removing to that plant the manufacturing carried on heretofore at Clinton street in Chicago, and part of the manufacturing which has been conducted at the company's factory in New York City. Some of the engineering and other administrative work of the company will be conducted at New York. This is announced to be for the purpose of avoiding duplication between the Chicago and New York offices and between the engineering department of the company and the telephone companies, its principal customers. The publicity department, under H. M. Post, has already been moved from Chicago to New York. Aside from the elevation of Mr. Thayer to the presidency, other changes were made. H. A. Halligan and F. R. Welles were elected vice-presidents; William P. Sidley, vice-president and general counsel, and George C. Pratt, secretary. Mr. Thayer has been connected with the company for twenty-eight years. Mr. Halligan has been for a number of years secretary and in charge of a large part of the American business. Mr. Welles' connection with the company dates back for more than thirty years. He has had charge of the foreign business, residing in Paris. Mr. Sidley has been acting as counsel for the company and will continue in that capacity.

A Society Pin for the United States Military Telegraphers.

The question of adopting a society pin or button for the Society of the United States Military Telegraph Corps, having arisen, it is recalled that a pin of this nature was once actually in existence. In fact, at the meeting held at Kansas City, Mo., September 15, 1890, the secretary at that time announced the selection of a pin or button of gold and enamel, which the members then present purchased at a cost of $1.50. Subsequently the pin seemed to pass into disuse and its very existence has been forgotten by many, and the design entirely so. In furtherance of the present suggestion to adopt a pin which shall become a permanent symbol of the society, inquiry has been made for one of the former pins to serve as a possible guide in influencing a new design. It is a singular fact that no one thus far approached in the matter has been able to respond with the production of the long-forgotten emblem. It is requested that any member having in his possession one of the old pins will communicate with David Homer Bates, secretary of the Society of the United States Military Telegraph Corps, 658 Broadway, New York.

Telegraphers' Dinner to Mr. Carnegie.

A dinner is to be given to Andrew Carnegie by his telegraph friends at the Hotel Manhattan, New York, on the evening of Friday, November 27, tendered in celebration of the seventy-third anniversary of his birth, an event, however, which correctly dates on the 25th inst. The following correspondence, which owes its origin to the suggestion of William J. Dealy, of New York, explains itself:

New York, July 14, 1908.

Mr. Andrew Carnegie,
Skibo Castle, Scotland.

Dear Sir:—You will be 73 years old November 25, 1908. "73" is the "God be with you" of our telegraphic code, the fraternal signal recognized all over the world. It would seem therefore quite appropriate for you to meet the telegraph friends of your youth and of your later years at a dinner on or about the date named.

A few of us have talked the matter over and authorized me to ask if you will accept our invitation to be present at such a gathering.

Yours very respectfully,
DAVID HOMER BATES.

Skibo Castle, Scotland,
July 24, 1908.

Mr. David Homer Bates,
658 Broadway, New York.

Dear Homer: That "73" business is taking, but don't go to too much trouble about it. If it comes with little effort all right. "73"

All well. We are up on High Moors, fifteen miles from Skibo; two weeks in retreat. Enjoying it hugely.

Yours ever,
A. C.

P. S.—It should be after not before the 25th.

The committee of arrangements includes, David Homer Bates, chairman; Belvidere Brooks, Charles P. Bruch, Albert B. Chandler, William J. Dealy, James Merrihew, Charles A. Tinker, Levi C. Weir and William B. Wilson. Colonel Robert C. Clowry will preside.

This affair, so full of promise to its promoters and all who expect to be present, will recall in its cordiality of expression the delightful and highly successful dinner tendered at the same hotel on March 28, 1907, by the United States Military Telegraph Corps to its commanders General Thomas T. Eckert and Colonel Robert C. Clowry, its historian, Colonel W. R. Plum, and to the father of the corps, Mr. Carnegie, an event which Mr. Carnegie has held in high appreciation.

The fact that the dinner will be held at the Hotel Manhattan brings pleasantly to mind another interesting fact, namely, that Mr. William S. Hawk, the proprietor, is a personal friend of Mr. Carnegie, who when the former was proprietor of the old Windsor Hotel, made that hostelry his New York home. It may be presumed therefore, that on the 27th inst., as at the function of last year, nothing will be omitted to make the occasion one of enviable satisfaction.

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System of Simultaneous Telegraphy and Telephony Over Telegraph Wires.

Experiments made by Aurio Carletti under the auspices of the Italian telegraph department between Caserta and Piedimonti are here described. The work was undertaken for the purpose of testing the Perego separator of simultaneous telegraphic and telephonic messages, but the device was found unsuitable for use between any two subscribers and could only be employed between the two offices at the extreme ends of the line. Better results were obtained with the arrangement shown herewith. The telegraph currents are separated from the telephone currents by means of a condenser C; T is a telephone transformer of the kind usually employed for connecting a single-wire to a double-wire line; j is the jack at the switchboard. In order to make the variable period of the telegraph currents slower and deaden the noise produced by them in the telephone receiver the well known arrangement of Van Rysselgerghe was employed, which consists chiefly of a coil g with strong self-induction connected in series with the line, and of a condenser C of two microfarads in multiple with the line. The coil g also serves for resisting the leakage of the telephone currents through the telegraph apparatus, the coil acting in this case as an impedance against the high-frequency telephone currents, so that they will pass preferably through the condenser C and the secondary of the transformer T. To the telegraphic currents, on the other hand, which are continuous, the coil g offers only its ohmic resistance. This arrangement gave good results and permitted communication from Piedimonti with subscribers in Caserta, Naples and Rome. However, there still was a considerable leakage of current through the telegraph instrument, which was detrimental. One way of reducing this leakage was to increase the impedance of g, but that would have disturbed the telegraph service too much. Furthermore, the impedance depends chiefly on the frequency, and consequently the leakage of the telephone currents will not be equal for all harmonics: It will be greater for the lower sounds and smaller for the higher ones, and thus the voice will be distorted. Another cause of serious disturbance is the intermittent exclusion of the telegraph receiving circuit. In the receiving position the electromagnet of the telegraph instrument will be in series with the coil g and add its impedance thereto; in the transmitting position the line is connected to the battery and the telephone currents can leak away freely through the battery, and thus the telephone current will be alternately weak and strong. To remove this difficulty an impedance coil might be inserted between the telegraph key and the battery, but this arrangement would be too complicated and would greatly increase the resistance and inductance of the telegraph circuit. A simpler artifice, which gives the same results,

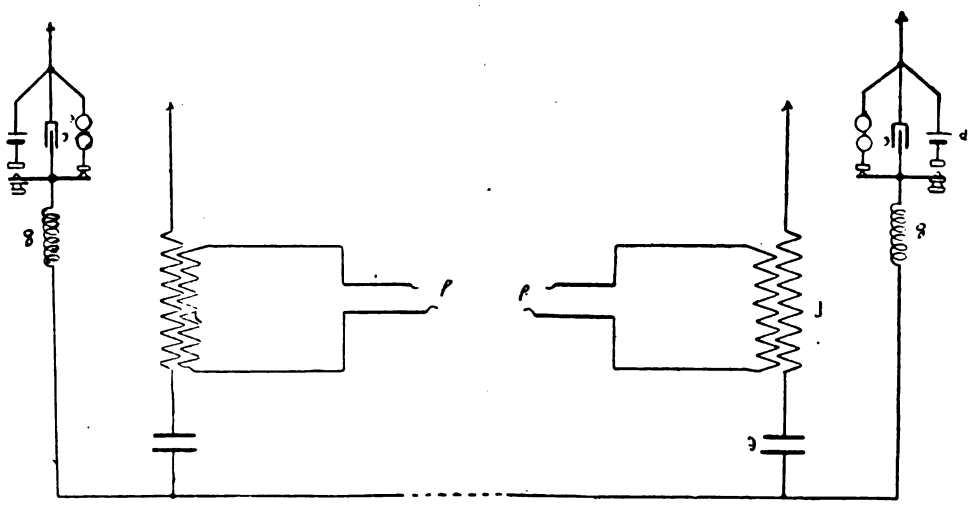

DIAGRAM OF CIRCUIT FOR SIMULTANEOUS TELEPHONY AND TELEGRAPHY.

is to put the telegraph receiver in series with the line. In this case the Morse receiver acts also as an impedance, and therefore the coil g may be eliminated. An arrangement which has not yet been sufficiently tested, but which might completely remove all the difficulties referred to is to put the transformer T in series with the telegraph line. In this manner all the telephone current is utilized, because it passes entirely through the transformer T, while in the arrangement shown herewith only a part of it passes through the transformer and the remainder escapes at A through the telegraph receiving group. The arrangements described are not suitable when the telegraph wires are disturbed by industrial currents.—Abstracted and translated from L'Elletricista (Rome), by the New York Electrical Review.

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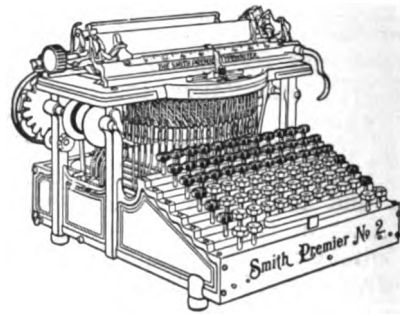

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NOVEMBER 16, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The telegraph service in the late election has been very generally commented upon for its excellence. A fine record was made. While the almost perfect weather conditions which prevailed throughout the country contributed as a factor in aiding telegraph transmission, at the same time it acted to draw out a very large vote, protracting and making the work of the count more difficult and the sending heavier. The newspaper press has not been slow to recognize and give full credit for the promptness and high efficiency shown. So well pleased, indeed, were the big metropolitan dailies that many of them sent individual letters of thanks to the telegraph companies for services rendered. The result of the election in the Empire State was known here in New York before seven o'clock in the evening. By half-past nine o'clock telegraphic reports from all states were received giving substantially correct figures of returns proclaiming the election of William H. Taft. The telegraph never played a more important part in the history of this country and never did its work so well as on November 3.

Neatness, Order and Discipline in Telegraph Offices.

Anyone of observant mind who has traveled in England cannot but have noticed the neatness and order which as a rule pervades the telegraph offices of that country. The spirit of respectful discipline existent in the service is another thing strikingly exhibited, finding agreeable expression even in the attitude of the messenger boy, whose usually cleanly and tidy appearance places him frequently in sharp contrast with his prototype on this side of the Atlantic. Americans are quick to see and prone to comment on such differences as those referred to, the criticisms evoked not always being to our advantage. It is unfortunate that sufficient cause should exist warranting such censure, more especially because there is no need of it, and because the evidence of careless conditions in office administration have a tendency to work to the detriment of the telegraph itself in public esteem.

Yet it must be apparent that the domestic situation as cited is well known to every superintendent and other officials whose duty of inspection brings them in direct contact with individual offices. While the existence of laxity in office management is deplored, and its hurtful influences recognized by the higher officials of the telegraph, the difficulties met in the way of effecting improvements appear to be many, and if not insurmountable, are, at least, not easy to overcome. Embarrassment to the superintendent, earnestly seeking proficiency, arises too often from the fact that managers are deficient in enforcing order and maintaining proper discipline within the sphere of their jurisdiction. The desirability—nay the necessity of keeping a telegraph office neat and clean, a fitting and attractive place in which to invite the public to transact its telegraph business should be obvious to any perceptive mind. Duty to employing interests demands it; a proper sense of self-respect should dictate it.

First impressions count for a good deal. The appearance of a well-kept room, with polite, attentive and well-informed persons in attendance, offers a concrete example, at least at the outset, of what should constitute a befitting telegraph office, one calculated to influence, win and eventually hold custom. Patronage is what we are seeking. What brings business to our doors, especially if it comes our way spontaneously, obedient to and following a natural trend made possible by attention, by good service, by the courtesy shown in the numerous ways familiar to the well-bred gentleman, always so agreeable to the recipient, stamps the head of the office as

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possessing at least some of the desirable qualities of management. Then, if in addition to those external exhibitions of fitness, the manager pursues a systematic and prompt handling and care of all records and files of his office, so that he can at any time make a clear and satisfactory report of conditions to his superior officer, another and a highly important measure of capacity will have been reached in his managerial aptitude.

The messenger service is an important auxiliary to the telegraph. Its hurrying representatives come in constant touch with the public at places of business, in the home, etc., and in the conduct and personal appearance of its individual members, the telegraph office from which they emanate, is affected one way or the other, according to the personnel, more vitally perhaps than many managers will be inclined to admit. Cleanliness of person, neatness of uniform, greater gentlemanliness of deportment, are essentials that every manager might materially promote if proper discipline was strictly enjoined. We are well aware what objections might be argued in this case, but the generic proposition nevertheless remains unaltered. The maintenance of careful and well-directed discipline is requisite to the moral and business welfare of every office, and its proper observance would exercise a tendency to raise the standard, not only of individual offices, but of the service at large.

The development of executive ability in the individual should proceed contemporaneous with the acquirement of a broader knowledge in telegraph engineering. The possession of both attributes would result in making the ideal manager of the future. More than this, such managers would be establishing themselves in the direct line of promotion. A beginning might well first be made by putting the office in order, then keeping it clean and making it attractive to the visitor. No one need be afraid that improved appearances will escape the observant eye of the superintendent, even if approving remark be withheld. A manager who conscientiously and intelligently elevates the standard of his office, starting with the physical act of "cleaning up," is working out a problem in the evolution of the telegraph from lower to higher conditions, which in its final rightful equation will carry its author along successfully in the impetus thus acquired.

Opportunities Still Exist.

Henry Clews, the New York banker, in a recent address, told Yale students that the fortunes of the future await the man who can check waste. He said:

"The pessimist is abroad preaching the gospel of discontent; and a favorite text is that the young man has no show or little chance to get on in life. Do not be misled or discouraged by such false doctrine. There never was a time when brains were at a greater premium than at present, nor courage, education, industry, and energy more requisite. Men at the top of the ladder are eager to delegate part of their burdens to smart, enterprising assistants, and it is not necessary for you to remain privates long, even though you do not become captains of industry. Intermediate positions combine the requisite salary with the moderate enjoyment of life and lack the nerve-wrecking responsibilities of the top-notchers. Capital awaits the young man who will devise methods of reducing waste. Railroads seek time-saving inventions; manufacturers seek means of minimizing labor; industry seeks cheaper substitutes for many of the articles now necessary."

The Study of Telegraph Engineering.

In pursuance of the publication begun in the November 1 issue of Telegraph Age of a series of letters received from a number of expert authorities in the telegraph service, sent to us by request, in which information is imparted of a character helpful to young telegraphers ambitious for success and promotion, the following letter, additional to those already printed, has also come to hand. These letters have been written by men who themselves have climbed the ladder of promotion, who have experienced hard conditions similar to those which confront so many in the struggle of life, and yet who have overcome difficulties by intelligent application, sheer will force and dogged persistence, and who have finally earned what they have received.

Mr. H. C. Shaw, assistant electrical engineer of the Postal Telegraph-Cable Company at San Francisco, Cal., takes up the subject under date of October 23. He writes:

In my opinion, to be successful in the electrical line of the telegraph it is requisite to have a thorough theoretical knowledge of the subject. To acquire this considerable study is indispensable, and in the case of a young operator whose time is chiefly taken up by his duties, the studying will necessarily have to be done during spare moments. In my own case, I found a great deal of help in Maver's American Telegraphy and also in a correspondence course in electrical engineering which I went through. In the meantime, while the studying is being done, no opportunity to improve in the practical side of the subject should be overlooked.

Opportunities in the Telegraph Service.

The manager of a telegraph office in the West, writing under date of Nov. 5 to renew his subscription, takes occasion to refer in approval to the editorial replies to communications received from operators expressing dissatisfaction with the service, recently appearing in Telegraph Age. What he says is so apropos to the general subject that, suppressing the name, we print his letter in full, although not written for publication. Here is what he writes:

Your two editorials regarding opportunities in the telegraph service, one in the September 16 issue, the other in that of October 1, answering two voices of discontent, interested me very much. I was partic-

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ularly impressed with a remark contained in the letter printed at the latter date in which the writer, in referring to himself, said: "I consider myself at thirty years of age a pretty fair operator, but there is no promotion in sight that I can make out, and that being the case I may ask, "What's the use?"

Our ages are nearly the same. I am twenty-nine, one year his junior. I have no wish to appear egotistical, but there is a certain analogy between us which has appealed to me strongly. Your correspondent whom I have quoted has no one to blame but himself, according to my way of thinking, for the circumstances of his condition, of which he complains. This I know from experience. I have only myself to thank for what share of success has come my way, and I want to tell you about it. Your articles are splendid and tell the exact truth. They have helped me. There is a future, I believe, in the service for all who will try for it. I mean earn it. For over a year now I have been manager of a commercial and railroad relay telegraph office. Six men are employed here besides a wire chief, covering 300 miles of road. Nine wires are operated from this office. I have endeavored to fit myself for my work by study and application. I am not where I am as the result of "pull;" I have worked hard for all I have gained. At twenty-six I held a good position in the railroad telegraph service; was then promoted to be night chief, and after two years was appointed to the place I now hold. My pay is over $100 per month, so you see I am perfectly independent. The trouble with so many operators is that they are afraid they will do too much work for the pay they receive; the tendency to loaf rather than to improve time by studying the technical side of the profession is noted everywhere, and with disaster to the individual.

I may add that we are always on the outlook for bright men for operators. If competent they will surely be advanced. It is up to them to show what they are good for and to qualify for better positions and pay.

International Conference on Electrical Units and Standards.

The International Conference on Electrical Units and Standards which met in London in the rooms of the Royal Society, Burlington House, on October 12, concluded its meetings on October 21. Our report, published November 1, covered the two dates of October 12 and 14. Resuming its sessions on October 16, the conference, according to the London Electrical Review, first considered the interim report of the technical committee. Dr. Glazebrook, as chairman of the committee, moved, and it was agreed, "That the Technical Committee be authorized to issue, as an appendix to the report, notes detailing the methods which have been adopted in the standardizing laboratories of the various countries to realize the international ohm and the international ampere and to set up the Weston normal cell."

It was decided, on the recommendation of the Technical Committee, not to alter the length of the mercury column in the definition of the international ohm from 106.300 centimeters to one meter.

Dr. Glazebrook then stated that it had been referred to the Technical Committee to consider whether the two zeros following the eight in the amount of silver deposited per second should be altered to any other figures, and if so, what figures. When the Technical Committee came to consider this, considerable differences of opinion arose, and it had been thought better to refer the matter back to a plenary meeting of the conference. The difficulty seemed to be that the international units were not identical with the C. G. S. units. This difficulty would still remain if the international units were only defined to four figures. The conference would be a failure, and would neglect to answer one of the important questions put to it, if it did not definitely fix the international units.

The president said that Resolution VI.: "The international ampere is the unvarying electric current which, when passed through a solution of nitrate of silver in water, in accordance with the specification attached to these resolutions, deposits silver at the rate of 0.00111800 of a gramme per second," was proposed and seconded and before the meeting twenty-one countries voted in favor of the resolution, and three, namely, France, Italy and Canada, against the resolution, out of twenty-four countries present and voting.

The conference next considered Resolution II., and it was resolved that the words "for purposes of trade and commerce" should be deleted, and the words "for the purpose of electrical measurements and as a basis for legislation" be substituted, the resolution then reading: "As a system of units representing the above and sufficiently near to them to be adopted for the purpose of electrical measurements and as a basis for legislation, the conference recommends the adoption of the international ohm, the international ampere and the international volt defined according to the following definitions."

Twenty-one countries voted in favor of Resolution II., and three, America, Belgium and France, against; twenty-four countries being present and voting.

Dr. Glazebrook then proposed to add an additional resolution: "That the ohm is the first primary unit," and it was accepted unanimously.

The conference proceeded to consider the steps necessary to secure uniformity of the standards in future. Professor Warburg moved "That the conference approves generally the draft scheme to establish a permanent commission to secure uniformity of administration in relation to electrical units and standards in the future. The conference refers the draft scheme to the Technical Committee to consider details and to nominate the first members of the commission."

On Monday, October 19, on the reassembling of the conference, Professor Arrhenius moved that the respective governments be invited to take steps to establish an international laboratory, and this was adopted.

Resolutions defining the watt were adopted, and a series of resolutions relating to secondary or working standards were approved. The establishment of a permanent international commission for electrical standards was recommended, a committee of fifteen to be appointed, in the meantime,

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by the president, to advise as to the organization of the commission and to perform other necessary duties in connection with the work of the conference, in co-operation with laboratories possessing the necessary equipment for precise electrical measurements. It was decided that steps should be taken with a view to combining future electrical conferences with the international conference on weights and measures.

The report shows that delegates were present from twenty-one countries, and also from the following British dependencies, namely, Australia, Canada, India and the Crown colonies.

The total number of delegates to the conference was forty-three. The conference and its Technical Committee each held five sittings. As a result of its deliberations, the conference adopted the resolutions and specifications set out in Schedule B, and requested the delegates to lay them before their respective governments with a view to obtaining uniformity in the legislation with regard to electrical units and standards.

The conference recommends the use of the Weston normal cell as a convenient method of measuring both electromotive force and current when set up under specified conditions.

In cases in which it is not desired to set up the standards provided in the resolutions of Schedule B, the conference recommends the following as working methods for the realization of the international ohm, the ampere and the volt:—

1. For the International Ohm.—The use of copies, constructed of suitable material and of suitable form and verified from time to time, of the international ohm, its multiples and sub-multiples.

2. For the International Ampere.—(a) The measurement of current by the aid of a current balance standardized by comparison with a silver voltmeter; or (b) the use of a Weston normal cell whose electromotive force has been determined in terms of the international ohm and international ampere, and of a resistance of known value in international ohms.

3. For the International Volt.—(a) A comparison with the difference of electrical potential between the ends of a coil of resistance of known value in international ohms, when carrying a current of known value in international amperes; or (b), the use of a Weston normal cell whose electromotive force has been determined in terms of the international ohm and the international ampere.

The duty of specifying more particularly the conditions under which these methods are to be applied has been assigned to the permanent commission, and, pending its appointment, to the scientific committee, to be nominated by the president, who will issue a series of notes as appendix to this report.

In Schedule B the resolutions were:

I. The conference agrees that as heretofore the magnitudes of the fundamental electric units shall be determined on the electro-magnetic system of measurement with reference to the centimeter as the unit of length, the gramme as the unit of mass and the second as the unit of time.

These fundamental units are (1) the ohm, the unit of electric resistance which has the value of 1,000,000,000 in terms of the centimeter and second; (2) the ampere, the unit of electric current which has the value of one-tenth (0.1) in terms of the centimeter, gramme and second; (3) the volt, the unit of electromotive force which has the value of 100,000,000 in terms of the centimeter, the gramme and the second; (4) the watt, the unit of power which has the value of 10,000,000 in terms of the centimeter, the gramme and the second.

II. As a system of units representing the above and sufficiently near to them to be adopted for the purpose of electrical measurements and as a basis for legislation, the conference recommends the adoption of the international ohm, the international ampere and the international volt defined according to the following definitions.

III. The ohm is the first primary unit.

IV. The international ohm is defined as the resistance of a specified column of mercury.

V. The international ohm is the resistance offered to an unvarying electric current by a column of mercury at the temperature of melting ice, 14.4521 grammes in mass, of a constant cross-sectional area and of a length of 106.300 centimeters.

To determine the resistance of a column of mercury in terms of the international ohm, the procedure to be followed shall be that set out in Specification I, attached to these resolutions.

VI. The ampere is the second primary unit.

VII. The international ampere is the unvarying electric current which, when passed through a solution of nitrate of silver in water, in accordance with the Specification II attached to these resolutions, deposits silver at the rate of 0.00111800 of a gramme per second.

VIII. The international volt is the electrical pressure which, when steadily applied to a conductor whose resistance is one international ohm, will produce a current of one international ampere.

IX. The international watt is the energy expended per second by an unvarying electric current of one international ampere under an electric pressure of one international volt.

One hundred and twenty-nine miles of new telegraph line has just been completed by the government between Valdez and Gulkana. This is a duplicate of the old line, which was inadequate to carry all of the business from Valdez and Gulkana. It connects at the latter place with the line to Fairbanks. In addition to the new line several changes were made in the route, especially through Keystone Canyon, where the wires now follow the new wagon road instead of going over the hill. Thirty men have been employed on this work all summer.

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How to Secure a Patent in the United States.

BY H. G. WARD.

The American law provides that "any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement thereof, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, and not in public use or sale for more than two years prior to his application, unless same is proved to have been abandoned, may upon payment of the fees required by law, and other due proceedings had, obtain a patent therefor." All patents are issued in the name of the United States of America, under the seal of the Patent Office, and are signed by the secretary of the interior and countersigned by the commissioner of patents. They are recorded, together with the specifications, in the Patent Office, in books kept for that purpose.

Fees and charges in taking out a patent are as follows: On filing each original application for a patent, $15; on issuing each original patent, $20; in design cases, for three years and six months, $10; for seven years, $15; for fourteen years, $30; on filing each caveat, $10; on every application for the reissue of a patent, $30; on filing each declaimer, $10; on the granting of every extension of a patent, $50; on an appeal for the first time from the primary examiner to the examiners-in-chief, $10; on every appeal from the examiners-in-chief to the commissioner, $20. Copies of drawings usually cost $5 a sheet.

Thus the bare cost of obtaining a patent is $35 for the government fee and $5 for a drawing, but in cases of a complicated nature the total cost of the patent will be more. However, the government fees are the same in all cases. It should be borne in mind that the rules of practice of the Patent Office advise that the assistance of competent counsel will, in most cases, be of advantage to an applicant for a patent.

Application papers comprise the petition, specification, oath, together with drawing, which must be filed in the Patent Office together with the first government fee of $15. As soon as the application is filed the applicant is protected against the grant, without his knowledge, of a patent of the same thing to another person. The petition, oath and specification must be written in the English language. From the viewpoint of the Patent Office it is desirable that all parts of the complete application be deposited in the office at the same time, and that all papers in the application be attached together.

Applicants for patents should not forget that the actual value of a patent is measured by the character of its claims. On this point a well-known patent attorney says: "While formerly the impression prevailed to a great extent that the essential thing to insure protection was a patent of some kind, the manufacturing public has been educated to understand that the vital and all-important part of the invention is its claims. If the claims are narrow and restricted, the patent is comparatively worthless; on the other hand, if the invention is well covered by broad and comprehensive claims, it will be found that the patent is readily endorsed by manufacturers."

Before any inventor can receive a patent for his invention he must make application therefor, in writing, to the Commissioner of Patents, and must file in the Patent Office a written description of the same, and the manner and process of making, constructing and using it, in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which it appertains, or with which it is most nearly connected, to make, construct and use the same. In the case of a machine, the inventor must explain the principle thereof, and the best mode in which he has contemplated applying the principle, so as to distinguish it from other inventions. The inventor must particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery. The specification and claim must be signed by the inventor and attested by two witnesses.

Inventors will do well to remember that a well-prepared specification and well-accentuated drawings will greatly expedite the allowance of an application by the Patent Office, as the examiner is thus relieved of annoyance and unnecessary work in the examination of the case. A case which is poorly and incorrectly prepared entails upon the examiner much study and extra labor in determining just what the applicant is seeking to claim. Loosely drawn specifications and inferior drawings naturally have a tendency to prejudice the examiner in his action.

An inventor has the right to call his invention what he pleases, provided he does not assume an already existing and popular name, to the prejudice of those who have preoccupied the name.

As a general rule, a single patent cannot embrace two devices which are wholly independent of each other, or embody distinct improvements upon unconnected machines. But where two or more devices relate to one subject or are connected in nature and operation, the courts have held that they may be secured by a single patent.

A patentee cannot claim in a patent the same thing claimed by him in a prior patent, nor cover what he omitted to claim in a prior patent in which the invention was described, unless he reserved the right to claim it in a separate patent, and seasonably applied therefor.

An inventor who makes any new invention and desires further time to mature the same may, upon the payment of the government fee of $10 and $5 for a drawing, file in the Patent Office a caveat setting forth the design thereof, and of its

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distinguishing characteristics, and praying protection of his right until he shall have matured his invention. The caveat will be filed in the confidential archives of the Patent Office and preserved in secrecy. It will be operative for the term of one year from date of filing. If application is made within the year by any other person for a patent with which such caveat would in any manner interfere, the commissioner of patents will deposit the description, specification and drawings of such application in like manner in the secret archives, and give notice thereof to the person by whom the caveat was filed. If such person desires to avail himself of his caveat, he must file his description, specifications and drawings within three months from the time of notification. A caveat answers a double purpose, first, to give notice of the inventor's claim, and, second, to prevent a patent from issuing to another for the same thing.

Patentees and their assigns and legal representatives, and all persons making or vending any patented article for or under them, must give sufficient notice to the public that the same is patented, by fixing thereon the word "patented," together with the day and year the patent was granted. When this cannot be done, owing to the character of the article, it will be sufficient to affix a label to the packages containing the articles a like notice. Severe penalties are provided for falsely marking or labeling articles as "patented."

A joint patent may be granted for a joint invention. When an invention is the result of the combined mental operation of two persons acting together, as neither can claim to be the sole inventor, the invention is joint, and they are jointly entitled to a patent on the article.

The duration of a patent is 17 years.

It is quite impossible to state with any degree of certainty the time required to secure the allowance of a patent. As all the various divisions of the Patent Office are considerably in arrears in their work, it takes from two to four months to procure a patent. Of course, when there are interferences or other obstacles to overcome the time required to do this is still longer.

Every patent or any interest therein is assignable in law. There are three classes of persons in whom the patentee can vest an interest of some kind in the patent. The first is the assignee, who may have had transferred to him in writing the whole interest of the original patent or an undivided part of such whole interest in every portion of the United States. The next is the grantee, to whom is transferred the exclusive right under the patent to make and use, and to grant to others to make and use, the thing patented within and throughout some specified part of the United States. The third class embraces the licensee, to whom may be transferred a less or different interest than either the interest in the whole patent, or an undivided part of such whole interest, or an exclusive sectional interest.

In conclusion attention is invited to a decision rendered in 1892 by Mr. Justice Brown in the Supreme Court of the United States, in which the following statement appears: "The specification and claims of a patent, particularly if the invention be at all complicated, constitute one of the most difficult legal instruments to draw with accuracy, and in view of the fact that valuable inventions are often placed in the hands of inexperienced persons, to prepare such specifications and claims, it is no matter of surprise that the latter fail to describe with requisite certainty the exact invention of the patentee, and err either in claiming that which the patentee has not in fact invented, or omitting some element which was a valuable or essential part of the actual invention."—Western Electrician.

Copper-Clad Steel Wire for Line Work.

Attempts to combine in a single wire the tensile strength of steel and the conductivity and rust-resisting quality of copper have been numerous, such as the early process of depositing the copper upon the steel wire electrolytically and the more recent method of mechanically working a heavy sleeve of copper over a polished steel billet and then rolling the billet down and drawing it into wires of the desired gage. Objections offered to wire for transmission purposes made by these processes have been that in the former the copper coat was too soft to stand abrasion and in the latter the adhesion between the two metals was not great enough, despite the rolling and drawing, to prevent an infinitessimal film of air from remaining to start oxidation of the steel and finally cause the copper plating to flake off.

By a process recently perfected by J. Ferreol Monnot a homogeneous union between the two metals is brought about by applying a thick coat of copper to the outside of a billet of steel, while both are heated to a high temperature, thus really welding the copper to the steel. The heat drives out all air and allows the plastic copper to mix with the softened surface of the billet most intimately. Any desired thickness of copper can be applied according to the requirements and the proportionate thickness remains the same in the finished wire. After cooling, the coated billet is reheated and run through rolls to reduce it to rods and finally to wire of three-eighth-inch diameter. In the drawing mill this is then drawn down to wire of any size. The copper and steel draw down equally and the softer metal has the same thickness throughout. The rolling and drawing harden the copper so that it becomes very dense and in excellent condition to resist wear, and it is stated that so perfect is the union of the metals, even before rolling, that efforts to break the copper away with a hammer on a tongue made by sawing radially into the edge of a transverse section or disk cut from a coated billet have been unsuccessful.—Electrical World.

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The Military Telegrapher in the Civil War.

PART X.

(Concluded.)

The extra contribution for publication in this series of articles, received from Thomas H. Brooke, of El Reno, Okla., the first part of which appeared in the issue of November 1, is herewith completed:

The next morning General Wheeler's command returned south and sent a detachment over to Fosterville to gobble our two companies, while the main army rested on the main road. We were entirely surrounded before knowing the enemy was near us. The wire north was open. I wired Chattanooga that we were surrounded and attacked, but before I could reach the stockade the battle had begun, cutting off my retreat thereto. I left the office and crawled through weeds to an old building where government stores were kept. A flag of truce was sent and our men surrendered and were marched off as prisoners. I thought I was the lucky boy again and would get back and report the matter. All seemed quiet. Very soon I heard a roaring as of an approaching train, yet there was no train due. What could it be? It was the house standing beside me, an old wooden shell, which burned like a pile of shavings. I must move quickly or get burned. I crawled through weeds until I reached a rail fence. I did not dare climb it and expose myself. With my foot I pushed away a rail near the bottom and crawled through. I reached a corn shock and was parting it to crawl in for protection against heat and exposure when I heard the click from four guns pointed at me.

I was caught for the first time, and there was no way out of it. My captors did not say a word. I threw up my hands and walked right over to them, and said: "Hello, boys!" I preferred to be friendly then. They said: "What in h—— do you want here? Who called you?" I said: "You signaled me to come and I did not want to argue the question." "Well, shell out" said a red-haired grizzly Texan, whose hair appeared never to have been combed or shorn since the war began and whose face had received applications of water but seldom. He stripped me of all personal effects, even to the last chew of tobacco, then, emphasizing his command by oaths, told me to mount behind him. Well, you ought to have seen that lean sharp-backed pony like a rail with the edge sharpened. I could see Wheeler's army apparently just starting to move forward on the main road. My man rode up under a shade tree and stopped with the remark: "Well, boys, let's get busy," at the same time looking up at a projecting limb. Two of the men were a rod or two in advance, the other beside us said, "Oh, come on!" and moved on slowly. My man had two heavy guns in his saddle front and his carbine strapped on his shoulders. I did not question their purpose. Every fiber of my body was nerve and strength. I was naturally a strong boy, then about eighteen years old. I felt equal to the occasion and determined that the very moment a move was made to loose a lariat from a saddle, that moment I would wrench my man from the saddle by the long hair of his head, and with gun in each hand would get the four of them. My nerve was steady, never more so. With oaths and threats the man with whom I was riding said he would not carry me another inch. I was requested by one of the other men to get behind him, while my former custodian spurred his horse under a shower of oaths and threats and soon disappeared. I was turned over to the colonel of the 11th Texas Cavalry, by whom I was treated very courteously. He introduced me to General Joe Wheeler, who was also very courteous and questioned me somewhat in regard to the information given out of his movements, which I gave correctly. General Wheeler on learning that I was a West Virginian, said: "You should be with us." He finally asked whether I would prefer to lodge in prison or go with him and be true to them as an operator. I said: "You would not trust me, General." He said, "Yes, I would if you would consent. I do not believe you would deceive me." He paroled me finally, and sent me safely beyond camp under guard so that I would not fall into the hands of any more grizzlies.

After a very fatiguing march I reached Murfreesboro and from there went to Nashville, and being on parole feared to risk service where the same men might recapture me. I then went to Mannington, West Virginia, my former home, and after a few days' visit with my parents, I was employed for special service along the line of the Baltimore and Ohio Railway, when I was ordered to Martinsburg. Arriving there the sound of heavy firing was in the air. General Crook was being driven back by General Early. Very soon I ascertained that I was the only operator, railroad or commercial, in the city, for the boys had retired beyond the city limits. General Crook and staff soon arrived, and he and his aide-de-camp wrote a number of messages and left courier and horse for me with instructions to stay until the last horn blew, but not to get captured. The general, accompanied by his staff and operator, took a position on the north side of the railroad on a high point, and shelled the enemy, partially holding him in check.

I was intent on handling the very important telegraph business to and from Washington, and failed to discover the true condition of affairs about me, until finally, awakened to the fact that my orderly and horse had moved on, leaving me on foot and between two lines of battle, our rear having fallen back. The balls fell like hail, picking up dust from the street and sidewalk. I had a great dread of southern prisons and determined to chance once again another run for dear life. I had learned to run. A foxhound could scarce have caught me. Without a scratch I passed our line of battle under deafening cheers

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from our men and reported to General Crook. Nearly thirty years after that event I met General Crook during his last tour of inspection at Fort Reno, Oklahoma, and referred to that experience. The General laughed heartily and said that he remembered it well, and complimented the war operators as possssing more than the average for bravery and faithfulness.

When Early made his raid into Maryland and attack on Washington, I was at Sandy Hook. I was ordered to report to General Lew Wallace at Monocacy Junction. The rebels had torn up the railroad track near Point of Rocks, which the engineer of the train in which I was traveling discovered in time to reverse the engine and save us from being wrecked in the canal. Our train was shot at and the fireman was killed. Every window in the coaches was shattered with bullets. We returned to Sandy Hook, but finally, by the assistance of a squad of our men, who cleared the way, we were able to reach our destination.

I went with General Wallace to Frederick City, where I met an operator who was just leaving with his family. He gave me his keys. General Wallace met Early in battle in sight of the city, but was compelled to fall back to Monocacy Junction. During the battle orderlies were busy carrying messages to and from my office, many of them being in cipher. I was rushed very much to keep my files clear about the time of the retreat, and as Early's left wing swung into the city, my orderlies narrowly escaped capture, and, without having been given notice of the situation, I found myself again in the midst of the boys in gray. I dumped all messages and instruments into the cellar and walked out to meet a Confederate patrol half a block from my office on the lookout for Yankee stragglers. "What street is this?" I was asked. "I do not know, I am a stranger here myself," I replied calmly. "Where from?" came the query. "From Baltimore," I answered with all the innocence I could force into my countenance and voice. "I am a clerk from Smith's shoe store on the corner of Baltimore and South street, sir. I came here hoping to find a friend of mine who enlisted at Richmond a year ago and is with General Early. His name is ————. His mother is at the point of death and requested me to search for her only boy that she might see him again. Sirs, can you help me to find him?" They started on before I had scarce finished my tale, but seemed somewhat touched by my story. Again and again I met the various patrols searching the city, but answered all questions with the same plea and with like result. Finally I discovered a party of Confederate officers on top of the Dill House, then the leading hotel, with field glasses, watching the battle at Monocacy. I ventured up, and after making some inquiry, asked permission to look through their glasses, which I did and could distinguish the fight. Shortly after this a troop of United States cavalry routed the whole gang, but not until they had ravished the stores of much valuable merchandise.

I accompanied our troops to Monocacy Junction, found the earth strewn with dead and wounded and the bridge across Monocacy River burned. I crossed on the eight square irons, one of the girders of the bridge, heated from the burning wood until my feet were badly blistered. The smoking chunks of ties almost stifled and blinded me, and it was with difficulty that I kept from falling into the deep water beneath. Several officers were present who preferred to swim rather than to pass through the ordeal. I found the wires destroyed, and followed up towards Baltimore, hoping to reach a live wire to report results, but failed.

This concluded my war experience. I went to Baltimore, worked in "B" office for a short time and in Washington several months under "Ham" Young, lately deceased, then assistant manager of the United States Telegraph Company, at 450 Fifteenth street, until after the assassination of President Lincoln.

The Telegraph in Brazil.

The telegraph system of Brazil is divided into eighteen districts of at least 600 kilometers of line, each of which is controlled by a chief engineer. The system in 1907 was composed of 29,475 kilometers of line and 53,602 of wire. If the lines owned by railway companies be included, the figures are 66.264 kilometers of line and 134,701 of wire. There were 513 stations belonging to the government, and including railway stations the number was about 2,000. The government has concluded arrangements with the railway companies for united working. The rights of foreign companies are limited to cable stations, of which there are nine, and to stations along the Amazon River, making a total of seventeen stations. All important centers are telegraphically connected. The federal government is undertaking the work of connecting the Amazon territory telegraphically with the southern territory, but owing to the nature of the ground to be traversed the work will take a long time. The length of the line will be about 2,000 kilometers. The total telegraphic business of the country amounts to about 4,500,000 telegrams, containing 67,500,000 words. In Brazil the telegraphic system is not regarded as a source of revenue to the treasury, the main object of the government being to facilitate as much as possible the use of the telegraphs, and to connect all the most distant parts of the Republic. Baudot instruments are being largely introduced, and are already in use between Rio and St. Paul, Bahia and Pernambuco, as well as between Rio and Rio Grand do Sul and other places.—Journal Télégraphique.

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Opportunity.

Mr. C. B. Arrington, superintendent of the Postal Telegraph-Cable Company, at Nashville, Tenn., has issued the following circular letter addressed to all managers of his company in Kentucky and Tennessee. It bears the title of "Opportunity," and speaks for itself:

"Some managers wonder why they never get promotion. The kind of managers who never get ahead are those who pay no attention to the tariff book, rules, and letters of instruction; who throw a circular letter aside, and later have to ask us for the information; who never learn to make up their reports correctly, throwing additional work on this office; who don't pay prompt attention to error cards, and numerous other details of their business. They never think about how long it takes a messenger boy to come and go, or look to see if the message he took out was receipted for. It never occurs to them to personally check up the list of boxes on their call circuits to see among other things if they are placed in the most convenient spot for the customer. We always try to promote our employes, everything else being equal.

"The following article, which appeared in Telegraph Age for October 16, supplies additional reasons for careless employes who are wondering why they never get ahead:

" 'If I had a chance, my position in life would be a better one,' is what one hears quite a number of men say. In some cases it is true; in others it is not. Too many permit the chance to pass them by; or, when the chance comes their way, they find themselves poorly equipped for the chance. A young man learns how to telegraph, how to manipulate the levers of a railroad signaling tower. The years pass by and he has no knowledge of anything else, except how to work the telegraph key and read the Morse language as it is clicked from the instruments. Switchboards are a mystery to him, and if called upon to make a 'cross connection' he is unable to do so. If his instruments or battery gets out of order he calls for a repairman and learns naught from him which might prove valuable in an emergency."

"The best way to get ahead is this: Post up and keep posted on your business. Wake up. Pay attention to what is told you. Save all circulars, rules and correspondence.

"No man can obtain promotion if he does not merit it. Seniority of service is of no value when a better position is in sight, unless one is competent to fill the position. Reliance on 'pull' is insecure, because such influence is liable to be lost through death, or the 'pull' losing its power. The best 'pull' is what one has stored away in the brain; what the hands have been taught to do. Eating so-called brain foods for breakfast, traveling the same old daily rut and growling about promotion not coming your way, wins nothing. We cannot all become presidents of a railroad, but every man ought to try to work himself up to a higher position. To succeed, he must know something more than his associates, because that superior knowledge lessens the number of his competitors. Be prepared to grasp 'Opportunity' when it knocks at your door.' "

Mr. Jesse Hargrave, also a superintendent of the Postal Telegraph-Cable Company, and who is located at Birmingham, Ala., occasionally orders marked copies of Telegraph Age sent to managers, chief operators and line repairers in his district, whether they are subscribers or not, calling attention to important articles, the study of which he deems essential as tending to increase efficiency in the individual and the telegraph service in general.

Mr. S. M. English, general manager of the Postal Telegraph-Cable Company of Texas, is still another telegraph executive who likewise makes use of the instructive articles appearing in these columns, directing attention to the same among the working forces of his company as a source of educational influence.

The Western Union Telegraph Company has also recognized the value of the utterances of Telegraph Age as expressed in its educational articles. Colonel Robert C. Clowry, president and general manager of the company, frequently orders copies sent broadcast to individuals and offices where it is believed they will do the most good.

Telegraph Operator Surprised by Talking Telegraph Relay on Composited Line.

Occasionally apparatus not at all related in appearance to the ordinary telephone receiver is found to lend itself to the reproduction of speech. Stories are current in some telephone exchanges of instances where magneto bells have been heard to talk. With the increase in the use of composited telegraph lines, over which service is given to railway employes, reporting of cases where telegraph relays are said to talk is becoming more and more common. One of the interesting occurrences of this kind recently happened in the office of the Grand Trunk Railway System at Keene, Ont. H. Nelson, the company's agent, was siting near his instruments one night when he heard voices as of people talking. Suspecting that there might be some trouble with the telephone which caused sound to be reproduced in the receiver, even though that instrument was on the hook, he lifted it, but as the voices had apparently stopped, decided it did not come from that source. He located the sound, on its reappearance, in the relay of one of the telegraph instruments at the other side of the room. He reports that he could hear conversations distinctly, one man saying, "How are you getting along with the wall?" the other replying "Not bad." He reports that voices were very distinctly heard, and on subsequent occasions he has heard conversations which were reproduced by the relay with clearness.—Telephony.

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The Creed Telegraph Printer.

This instrument completes the Creed printing telegraph system, in which the message is first treated by an operator at the Creed keyboard perforator, producing a paper tape with perforations representing the message in the Morse code. This tape is identical with the Wheatstone perforated tape, and is passed through a Wheatstone transmitter, which sends to line the desired long and short currents. At the other end of the line the received signals actuate the Creed receiving perforator, which reproduces an exact copy of the transmitting slip. This received slip is then passed through the Creed printer, reproducing the message in Roman characters on a paper tape, which is then pasted to a telegraph form or blank. The instrument can print reverse upon the tape, so that when the tape has been pasted upon the blank form a true face copy of the telegram may be obtained upon an ordinary opaque form by means of the damp-copying process. This form can then be sent out for delivery, and the original tape retained at the telegraph office.

The received perforated tape can be run through the printer several times, and, in addition, can be utilized to re-transmit the signals to any other line equipped with Wheatstone apparatus.

A diagrammatic explanation of the action of the printer is given in the accompanying illustration.

The received perforated slip is passed into the machine at A, as shown in the figure, and out at B; while the slip on which the printing takes place is drawn by a pair of feed-rollers from the roll on the upper left-hand side, between the connecting rods of the type-bars and over the printing platen.

The perforated tape is fed forward letter by letter in a guide-way in front of a series of ten pairs of selecting needles, one needle of each pair being mechanically connected to a series of ten slide-valve plates. Each of these valve plates can be made to occupy one of two positions, thus providing a number of different combinations, every one of which opens one complete and particular passage through the ten slide-valve plates. Air under pressure can thus be admitted to any one of a number of small cylinders, each containing a piston acting on the end of a lever connected to a type bar.

The perforated slip is fed forward by a star wheel fitted to a spindle carrying a toothed wheel, which is rotated as required by the movement of a rack. The rack is given a vertical motion for feeding purposes, and a sidewise motion for acting on any slide valves that may have been selected. Its movement is obtained from the camshaft of the machine, which is belt-driven from a small electric motor. The extent of the vertical movement is limited by the distance to the first space signal, that is to say, the length of a letter. To provide for this limit there is a group of ten space levers normally in the path of the rack, and preventing its downward movement. Each space-lever is also in the path of one pair of selecting needles, and when either needle of a pair passes through a perforation, that particular space lever is moved out of the path of the rack. Hence, with any letter or figure of the international Morse code there is a clear downward path for the feed-rack until it reaches a space signal. A sidewise movement is then given to the rack, putting it in gear with the toothed wheel. Next, the rack is given an upward

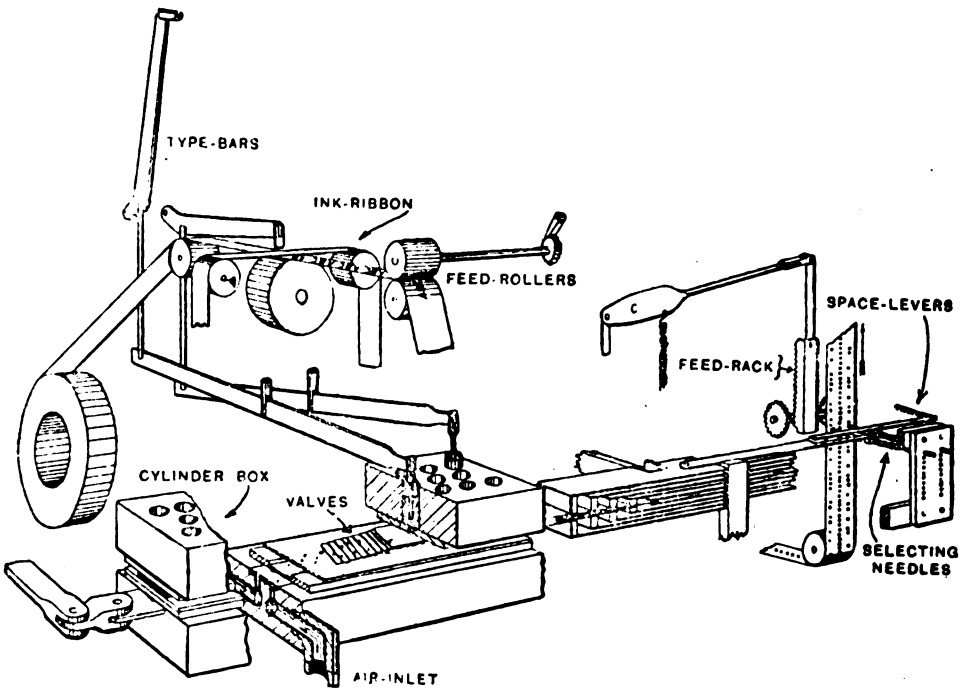

DIAGRAM SHOWING ACTION OF PRINTER.

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motion, causing the toothed wheel to turn and the perforated tape to be fed upward by the amount of the particular letter that has just passed. The rack is then moved sidewise again, clear of the toothed wheel, ready to descend as far as the next space signal.

The slide valves made of thin sheet-steel have each a hinged extension whose further end is arranged to take up the movement of the corresponding selecting needle in its motion to and from the perforated tape. At the same time, the extension is free to move in a direction at right-angles to the needle. Each valve-extension is provided with a shoulder which comes into the sidewise path of the feed rack when that particular extension has been selected. At the correct moment, determined by the position of a cam on the main spindle, the rack is moved sidewise, and engaging with the shoulders of the valve extensions which have been selected, moves the corresponding slide-valves into their second position. Another cam opens a main valve, admitting air under pressure to the slide-valve chamber, whence it passes through the ten valve plates by the one hole available in that particular setting of the valves, forces up the particular piston and prints the corresponding letter. Another main valve is then opened to allow the air to escape, and the selected slide valves are returned to their normal position.

Although more than the required number of selecting needles for any particular letter may pass through the tape, only the proper number of slide valves are acted upon by the rack, on account of the spacing lever preventing the rack descending beyond the required amount.

It will be observed that there are twenty selecting needles, but only the ten acting on the lower row of holes in the perforated slip are attached to valves; the other row of needles is not necessary for selecting purposes, but is required for shifting the space levers for the first portion of a dash signal.

The machine prints satisfactorily at any speed up to one hundred and twenty-five words per minute; but this is not the maximum, it being considered possible to reach one hundred and fifty with the present form of machine, and this will probably be increased with improvements in details.

The chief claim for this system of telegraph printing is the undoubted advantage obtained by using the well-known Morse code, entailing no alteration of existing telegraphic apparatus nor need for operators to learn a new code. Intermediate stations, such as repeater stations or testing points, can check the passage of the signals without any knowledge of the Creed system, and can make all necessary adjustments without reference to the terminal stations. The system, being an addition to the Wheatstone system, can be introduced gradually without disarranging any of the present Morse methods.—London Electrical Review.

In reply to a letter addressed to Mr. F. G. Creed, at Glasgow, Scotland, the inventor of the Creed system, by the Editor of Telegraph Age, asking him whether the pasting of the printed tape on blank forms did not involve a needless loss of time, thereby constituting a defect in his system, he writes:

"With regard to the new printer, I may say that it is a mistake to suppose that pasting of the printed tape involves delay. On the contrary, it saves time. You will readily understand how a page-printing machine, involving the necessity of frequent stoppages for change of line, must not only be more complicated, but must work very much faster (to turn out a given amount of work in a given time) than a tape-printing machine which runs steadily on. Thus, I can turn out a steady one hundred words per minute with my machine right through the day. The tape is drawn through an automatic gummer as it issues from the printer and the messages can be ready for delivery within half a minute from the time they left the transmitter at the distant station. There is no delay at all in pasting even at one hundred words per minute. A very smart man could probably paste quite safely at one hundred and fifty words per minute. Press copies of the messages are taken in the usual way.

"I may say that by a recent improvement of the receiver, I have been able to punch perfectly at a speed of two hundred and twenty-five words per minute from signals received on an ordinary post-office telegraph relay under the control of an ordinary Wheatstone transmitter. I send you a piece of tape so punched. It measures twenty-two and one-half feet in length, and was punched in half a minute, and contains, according to standard measurement, one hundred and twelve and one-half words. This speed may seem to you almost impossible, but I assure you there is no mistake about it. I ran the stuff myself, and measured it most carefully, and the machine was actually punching at the rate mentioned. That means that when running dots (i. e., plain reversals) it punched nearly two hundred holes per second.

"The Creed system is at work in the British post-office on only two main wires, viz., Newmarket and London to Manchester, and London to Birmingham, Manchester and Liverpool. On the first wire London and Newmarket run news work to Manchester, where it is repunched on the Creed puncher, and retransmitted to various out stations. On the second wire London runs news work to Birmingham, Manchester and Liverpool, which receive simultaneously, and these places in turn run to London and to each other. The receiving station, or stations, in each case receives on a Creed perforator, and print the stuff, sometimes in manifold, for delivery. The printer used on these wires is known as the Murray-Creed, being a combination of the Creed and that of Donald Murray. The line speed maintained is one hundred words per minute. A similar circuit is installed between London and Copenhagen on the Great Northern Telegraph Company's lines, where London runs to Newcastle-on-Tyne at ninety words per minute, where it is punched on a Creed receiver, and then retransmitted across the North Sea to Frederica,

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Denmark, where it is again retransmitted to Copenhagen, there being received on a Creed receiver, and printed for delivery on a Murray-Creed printer. This, as well as the postoffice installation, has been working satisfactorily for nearly two years. The Great Northern can receive Wheatstone on the Creed receiver, across the North Sea cables, at sixty to ninety words per minute, and at Newcastle-on-Tyne there is one of the new Creed printers, the first one so far introduced, which is used with great satisfaction for printing messages for delivery at Newcastle. The Great Northern has, of course, the heaviest kind of code traffic.

"Creed receivers are installed for retransmission purposes at the Valentia station, Ireland, of the Anglo-American Telegraph Company, where traffic is received at from seventy or eighty to one hundred words per minute from London on a Creed receiver, the slip from which is used to control a machine which punches another slip according to the cable code, which slip is then broken up for transmission over the various cables. A similar system has been installed at Valparaiso, Chili, in order that the signals received in Buenos Ayres may be automatically punched at Valparaiso, and translated for transmission over the cables of the Central and South American Telegraph Company. I have not been able to learn whether this installation is working satisfactorily or not, but that at Valentia has been working perfectly for over a year.

"Creed receivers are also used for retransmission purposes at Bombay and Calcutta, India."

How the First Report of a Railroad Accident Went Over the Wire.

"I sent over the wire the first report of a railroad accident the telegraph ever carried, and without being a telegraph operator at that," said Wilmot M. Vail, an octogenarian citizen of Port Jervis, N. Y., to a New York Sun reporter. "The original Cornell telegraph line opened at Goshen its first office in this state west of the Hudson. This was in 1849. The office was in my father's book store. I was a clerk in the store. My brothers, Hector and Nathaniel, soon learned to operate the instrument, and Hector became the first regular operator. The Erie Railroad put its telegraph line in operation early in 1851. Its wires entered the Cornell offices. Hector Vail was sent to Port Jervis as operator for both lines. Nathaniel Vail took charge of the Goshen office.

"I had not learned to operate the telegraph instrument, but from hearing and seeing my brothers working at it I had obtained some little insight of its mysteries. One day in 1851 my brother Nat went to New York. That day the westbound train known as the Day Express ran off the track three miles east of Goshen and into the ditch. Although the Erie had its own telegraph line it had not yet begun to utilize it for running trains on telegraphic order.

"An hour and more having passed beyond the time the day express should have arrived at Port Jervis, people there began to want to know what was the matter with it, and Hector Vail began to call up Goshen. He didn't know that Nathaniel Vail was away. We knew at Goshen all about the accident to the train. I heard the call on the instrument, but telegraphing not being in my line I let it call. The calling kept up at intervals for an hour or two, and thinking the matter over, I concluded that it was perhaps Hector Vail wanting to find out what had become of the day express, which was still off the track, so I thought I would answer the call myself.

"Studying the Morse alphabet a while, I pounded off on the keys as I best knew how the news about the wrecked train. I was a long time doing it, and the message I sent must have arrived at the Port Jervis end of the wire in a somewhat irregular and jumbled form, for although Hector Vail got the news he had been hours clamoring for, he sent back this forcible but ungrateful query:

"'What d—— fool sent this in?'

"And that's the way the first report of an accident on the Erie or any other railroad was sent over the telegraph wire.

"Recalling those days of pioneer telegraphing, I remember that Ezra Cornell was so poor after he got his line to working that when he came to Goshen to look over the property, if there was no money in the office from telegraph tolls my father would advance him some, so that 'Old Bones,' as he was irreverently called, might get something to eat. A few cakes, a slice of bread or a morsel of cheese sufficed him. Yet that struggling pioneer telegraph line was the source of his millions, and the foundation of the famous university that bears his name."

Book Review.

An interesting contribution to the literature of wireless telegraphy, considered as a study from a mechanical, historical and scientific point of view, has been made in the new volume entitled "Radio-Telegraphy," by C. C. F. Monckton, an English electrical engineer, of which the D. Van Nostrand Company, New York, are the American publishers. The subject, which is clearly and intelligently, yet simply, treated, is developed from its fundamentals in logical and unfolding sequence, and affords the student and general reader who is looking for information, an excellent conception respecting a system of telegraphy of such growing importance as the wireless. In the appendix will be found a résumé of the articles of the International Radio-Telegraph Convention of 1906, at Berlin, Germany. This volume of 272 pages is well printed on heavy paper, and is copiously illustrated, more than 170 figures appearing. It will be sent to any address, carrying charges prepaid, on receipt of price, $2.00. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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Directory of Annual Meetings.

Association of Railway Telegraph Superintendents meets at Detroit, Mich., June 23, 24, 25, 1909.

Commercial Cable Company meets the first Monday in March, at New York.

Gold and Stock Life Insurance Association meets the third Monday in January, at New York.

Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Atlantic City, 1909, at a date to be named later.

Old Time Telegraphers' and Historical Association, will meet at Pittsburg, Pa., at a date to be named later.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers Association meets in 1909 at Columbus, O., at a date to be determined upon.

The stockholders of the Western Union Telegraph Company meet the second Wednesday in October, at New York; election of officers occurs on the third Wednesday in October.

Orders for books on telegraphy, wireless telegraphy, telephony, all electrical subjects, and for cable codes, will be filled by TELEGRAPH AGE on the day of receipt.

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The Railroad.

During the week of the Missouri State Fair trains of the Missouri Pacific system, of which E. A. Chenery, is superintendent of telegraph, will be operated between Sedalia and the state fair grounds by telephone, the first test of this system in Missouri.

Mr. J. D. Morton, of Toronto, Ont., chief accountant of the Canadian Northern Railway, has been elected general auditor of the same system in addition to his duties as chief accountant. Mr. Morton began his career as a messenger and telegrapher and was a knight of the key at various points in Canada and in the United States for over twenty years.

Mr. R. R. Jamieson, general superintendent of the central division of the Canadian Pacific Railway system, with headquarters at Winnipeg, Man., has resigned to become president of the Merchants' Fire Insurance Company and other insurance interests. Mr. Jamieson began his career as a telegrapher and advanced through the various grades of the railway service to the high position he occupied at the time of his resignation.

The Delaware, Lackawanna and Western Railroad Company are preparing to put in early operation a telephone train despatching circuit covering the Morris and Essex division west from the Hoboken terminal. When completed this new despatching system will extend unbroken from Hoboken to Buffalo, a distance of 410 miles. This work, in forwarding which so much energy has been displayed, has been conducted under the supervision of L. B. Foley, superintendent of telegraph.

The Grisson Rectifier.

An improved type of this alternating-current rectifier, with aluminium electrodes, which was first brought out in 1903, is here described. The former glass cell has been replaced by an iron cell in order to permit air cooling in place of the original method of cooling by water, which proved impracticable. It has also been found of advantage to give the aluminium electrodes an inclined position, so as to permit an easy escape of the hydrogen bubbles. The electrolyte consists of a solution of specially prepared bicarbonate of soda in pure water in proportions of one to sixteen parts. The rectifiers are furnished with electrodes already formed, but they have to be "polarized" before being put in operation, that is, the aluminium electrodes have to be provided with a coating of oxygen bubbles. Tables of the operation of a rectifier on a 110-volt alternating-current circuit of fifty periods per second under varying loads indicate a maximum efficiency of seventy-five per cent., and of seventy per cent. on a 120-volt, fifty-period, polyphase circuit. By connecting the cells in series or multiple they may be used for any tension or current intensity and adapted to any purpose.—Abstracted and translated by the Electrical Review, Chicago, from Elektrotechnische Zeitschrift, Berlin.

The New Skirrow Word Counter.

A new word counter, the coming of which has so long been awaited, and for which such constant inquiry has been instituted, has at last made its appearance. This little device, which is of so much value to the operator that the inability to procure one of its kind, as has been the case ever since the manufacture of this class of instruments ceased, has caused decided inconvenience. The new instrument will be known as the "Skirrow Word Counter," it being the invention of John F. Skirrow, associate electrical engineer of the Postal Telegraph-Cable Company, New York. It is manufactured by J. H. Bunnell and Company, of New York, whose reputation for turning out strictly first-class work entitle all articles of their manufacture to rank among the best of the kind produced. At present this counter as manufactured is furnished with attachments to fit the Remington typewriter only, up to and including their No. 9 machine.

The Skirrow device is circular in form; it differs in design from the old, and is a neat and well-finished affair. Its mechanical simplicity of construction enabling it to perform its work of registration in a natural and satisfactory manner, free from all complication, and such, moreover, as to render it practically impossible to get out of order, will recommend it very generally.

The counter consists of a single interior wheel, bearing on its periphery the numbers one to fifty, specific disclosures of which are made through an opening in the outer case caused by the automatic working of the attachment, the last counted word alone being visible. While this initial record of numbers, limited to fifty, is sufficient to register a full enumeration of words included in the average message, nevertheless those overrunning that limit are also counted, the mechanism repeating itself simply, and so on ad infinitum.

As the Skirrow word counter is the conception of a practical commercial telegrapher, one who is familiar with the needs of the craft, it may be said that this latest production, overcoming objections observable in previous instruments, will meet all the requirements of the telegraph operator seeking a registration device with which to count the message words that he receives on the typewriter. Another point in favor of this new counter lies in the fact that it is strongly made, sufficiently so to withstand the hard usage such instruments, which in the past have been of more delicate construction, are frequently subjected.

The price of the Skirrow word counter is $3.00 express or mail charges prepaid. Address all orders to J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

"Pocket Edition of Diagrams," etc., by Willis H. Jones, electrical editor of Telegraph Age, embodies more practical information concerning the telegraph than any book or series of books hitherto published. See advertisement.

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Committee Report Respecting Trawling Injuries to Cables.

The report of the English committee appointed to inquire into the causes of, and to suggest remedies for, the damages done to submarine telegraph cables off the Irish coast has been issued. The committee was appointed in July last, and was constituted as follows: Sir J. C. Lamb, C.B., C.M.G., formerly second secretary to the Post Office, chairman; W. R. Culley, I.S.O., submarine superintendent in the engineering department of the Post Office; Commander G. C. Frederick, R.N., professional member of the harbor department of the Board of Trade; C. E. Fryer, I.S.O., superintending inspector of English fisheries; W. S. Green, C.B., chief inspector of Irish fisheries; Commander G. M. Marston, R.N., of the hydrographic department of the Admiralty, and F. J. Brown, secretary's office, General Post Office, secretary.

Eight meetings were held in London, and the cable companies on whose behalf evidence was tendered, included the following: Anglo-American Telegraph Company, Commercial Cable Company, Western Union Telegraph Company, Eastern Telegraph Company, Great Northern Telegraph Company, Telegraph Construction and Maintenance Company, India Rubber, Gutta Percha and Telegraph Works Company, and Siemen Brothers and Company.

The report, which is lengthy, deals with the committee's consideration of the evidence, which is summarized under two heads: First, Is injury caused by trawlers? and, second, What steps can be taken to prevent injury?

An English contemporary in its report of the proceedings says: The committee endeavored to ascertain why there was comparatively little complaint of injury to cables in the North Sea. The reasons generally given were that the majority of the cables in that sea were of a heavy type, that the sea bottom was even, and that the cables had a tendency to sink into the sand. The committee think these reasons may be accepted, but they also think that the comparative immunity of the cables may be due to some extent to the attention which the owners of trawling vessels on the east coast have given to the construction and maintenance of their trawling gear. This attention is the outcome of friendly representations made to them by the Great Northern Telegraph Company, and also of the harmonious relations between the fishermen and the cable staff of the Post Office.

Both the Anglo-American Telegraph Company and the Commercial Cable Company asked for the prohibition of trawling in an area to the west and southwest of Ireland, which according to the marked chart submitted by the Anglo company embraces about 3,400 square nautical miles; the other Atlantic cable companies in general terms support this request. The Anglo-American company suggest the following alternatives: first, that trawl-owners should alter the design of their trawls so that they may ride over the cables and not engage them; and, second, that they should be compelled to trawl in the same direction as the cables lie, and not across them. The first of these alternatives is referred to later; the second is not concurred in by the other cable companies.

The area indicated, the committee said, would not embrace the fishing grounds over which are laid the cables of the Western Union Telegraph Company, the Compagnie Française, the Eastern Telegraph Company, the Direct Spanish Telegraph Company, the Great Northern Telegraph Company, the Deutsch-Atlantische Telegraphengesellschaft, or the Post Office, and would exclude a portion of the Azores, Weston-super-Mare, and Havre cables of the Commercial company itself. It would leave quite unaffected the fishing grounds on the American side of the Atlantic, where the cables of British and other companies are exposed to greater risk than on the European side. The injury there, it is true, is not caused by trawling gear; but is caused by fishing vessels, which make it a practice to anchor on the grounds traversed by the cables. It need scarcely be said that injury by anchors is not less objectionable than injury by trawling gear. The Anglo-American Telegraph Company testified that for eight interruptions attributed to trawlers on the European side of the Atlantic, there were forty-three on the other side attributable to fishing schooners; and both the Anglo and the Commercial companies keep repairing steamers on the American side of the Atlantic because there is more for them to do on that side than on the European.

Compliance with the request of the Atlantic cable companies, therefore, while it would have the effect of closing a wide area to fishing operations would afford inadequate protection for cables, and could only lead to demands for the closing of other, and, perhaps, wider areas.

The Atlantic cable companies admit that proscription by His Majesty's government alone could not be recommended, seeing that, while it would shut the door to British fishermen, it would leave it open to the fishermen of other countries. If there is to be proscription, they realize that it must be international, and must apply to vessels of all countries. It would be easy to refer to precedents for the imposition of restrictions on fishing operations. But such restrictions, whether acquiesced in by the fishermen or not, have almost invariably had for their object the preservation of fish and the protection of the fishing industry itself. Even in the case of the International Convention for the Protection of Submarine Cables, some of the regulations were expressly designed to safeguard the fishing industry; and it is impossible to forget the difficulty which was experienced in inducing the various countries concerned to agree to the moderate protection which the convention provides for cables.

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But, apart from any question of precedent and whether difficulty with other countries might be encountered or not, the committee were unable to recommend the proscription of the area described by the Atlantic cable companies. They considered that it would be an unjustifiable interference with a business which represents a capital of several millions, gives employment to a body of hardy and industrious men, and supplies a substantial part of the food of the people; while its enforcement would involve police measures of a difficult and costly nature.

The committee have considered suggestions that the position of cables should be shown exactly on Admiralty and other charts, with a view to the avoidance of trawling in their immediate neighborhood. But, apart from any other objections to this course, the committee think that it might not be of much utility in practice, as the fishermen cannot, as a rule, fix their position so accurately out of sight of land as to enable them to confine their fishing to the grounds between the cables. Thus the avoidance of trawling in the vicinity of cables might resolve itself into its practical prohibition in wide areas, and this, as already stated, the committee are not prepared to recommend.

The committee mentioned an alternative proposal of the Anglo-American Telegraph Company, and call attention to certain proposals of the Eastern Telegraph Company and the Great Northern Telegraph Company. These are all practically of the same kind; and the committee think that in their direction lies the true solution of the difficulties which have arisen. The fishermen, left free to fish on grounds traversed by the telegraph cables, should be called upon to do what lies in their power to make their gear as inoffensive as possible; and they should further assist the cable companies by carefully trying to clear their trawls when they foul a cable, and should report every occasion on which they have lifted, or think they have come in contact with a cable. This view is generally accepted by the representatives of the trawlers. What is required, above all things, is a friendly understanding between the two interests; and the committee are convinced that a great deal can be done by co-operation and efforts at mutual accommodation.

While, however, attaching importance to friendly communication and co-operation between the cable companies and the representatives of the trawling industry, they do not think this is sufficient. However well disposed the owners of trawling vessels generally may be, there will probably always be some who may not be ready to adopt methods which are recognized as necessary in the interests of the cable companies. Moreover, there may be excusable differences of opinion as to what is necessary. The committee are therefore of opinion that the government, by a system of inspection, should take steps to level up the practice generally to that which may be regarded as the best. They think that this is necessary and indeed urgent, and that any expense which might be incurred would be justified by the importance of the public interests at stake. The aim of the inspection should not—at present at any rate—be the adoption of any particular type of otter board, but the elimination, in all types, of obvious defects. The evidence given by Mr. Alexander Siemens shows the necessity for these precautions. The adoption of one appliance or another may depend to some extent on the ground over which it is expected that the trawling operations will take place, although it probably depends more on the whim of the trawling skipper. In the present state of knowledge on the subject it would not, in the opinion of the committee, be desirable for the government to interfere in this matter. But all attachments should be as simple and smooth as possible, and in every part of the otter board the aim ought to be to afford no resting place for a cable if it should chance to be caught.

Among suggestions for modifications of the gear is one by the Eastern and Anglo-American companies for a tripping rope. The committee do not see their way to recommend this suggestion, but they mention it as indicating a direction in which improvements might possibly be sought.

At all the ports visited by the committee, as well as at the inquiry held in London, the representatives of the trawling industry acquiesced in the suggestion that there should be government inspection. At the same time, they urged that it should be carried out by independent officers well acquainted with the requirements of fishermen, and that as a matter of fairness it should extend to foreign vessels. There can be little doubt that an agreement with other countries is necessary, and the committee think that eventually there may have to be a formal international convention if the inspection is to be permanently effective. Without such a convention an act might, it is true, be passed to make it illegal for foreign trawlers carrying injurious trawling gear to land fish in British ports. But legislation of this kind would be difficult to carry out, and would give rise to much irritation and dispute. It would be an extraordinary thing for England, moreover, to pass a law which, while directed against the foreigner, was not in defence of purely British interests, but in defence of an interest which to a large extent is not British. It is obvious that the question is international.

If compulsion of any kind were found necessary, a conference of the countries concerned would doubtless have to be held to settle the terms of a convention. The subject is too much beset with difficulties to permit of an understanding being arrived at in any other way.

It will be for the cable companies on their side to consider how far they should substitute a somewhat heavier type for the existing cable in certain areas. The Anglo-American Company has al-

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ready adopted this precaution. The Great Northern Company and the Deutsch-Atlantische Telegraphengesellschaft have also in certain cases substituted heavier types of cable for previous types which they found liable to damage, with the result that such liability is found to have diminished.

The report concludes with the following summary:

1.—The committee are of opinion that injury is sometimes caused to submarine cables by otter boards of certain types and boards out of repair, and by beam trawls with defective trawl-heads

2.—They think that there would be little risk of injury from trawls of either kind if they were always suitably constructed and in good condition.

3.—They find that the owners of trawling vessels are generally willing, and indeed anxious, to modify their trawling gear with the view of minimizing the risk.

4.—They are not prepared to recommend the proscription of an area beyond territorial limits.

5.—They recommend that all cable companies should (as certain companies and the Post Office have already done) establish friendly relations with the fishermen who frequent the waters in which their cables are laid; while the fishermen on their part should try to clear their trawls when they foul a cable, and should report the position of any contact with a cable.

6.—They recommend that a system of government inspection of the gear of trawlers be at once instituted.

7.—They recommend that steps be taken through the diplomatic channel to invite neighboring foreign states to adopt a similar system of inspection.

8.—They think that eventually an international conference should be necessary to settle the terms of a convention on the subject.

9.—They recommend that the cable companies should consider the question of substituting heavier types of cable in the areas affected.

Radio-Telegraphy.

A patent, No. 901,649, for space telegraphy, has been granted to Oscar C. Roos, of Newton, Mass. A duplex space telegraph system in which the transmitting and receiving apparatus are permanently connected with the antenna or elevated conductor and are constructed and arranged to be operated simultaneously without mutual interference.

Prof. J. A. Fleming, in a recent lecture in London, discussing the scientific principles of radio-telegraphy and radio-telephony, mentioned some wireless problems awaiting solution. These were, he said: An effective means of "transforming-up" the frequency; the concentration of radiations in a given direction; automatic receiving and transmitting apparatus operating at high speeds, and a means of simultaneously using the same antenna for sending and receiving messages.

The United Wireless Telegraph Company having acquired by purchase a factory property at Seattle, Wash., it will be taken over by the operating department of the company, headed by C. C. Galbraith, and work will begin at once in the manufacture of wireless apparatus for use on the Pacific Coast. The first wireless instruments to be turned out will be for a demonstrating wireless station at the Spokane, Wash., fair.

In England on October 15 a rearrangement in regard to radio-telegrams at coast stations to and from ships, went into effect. In most cases the Marconi company's sailing lists remain the standard source of information with regard to communication with ships through coast stations in the United Kingdom. In future the charge for telegrams intended for transmission to the ships in those lists will be at the inclusive rate of ten and one-half pence a word, without any minimum. If the ship to which the message is addressed is known to have passed out of range, and no attempt is made by the coast station to transmit the message, the charge (less the ordinary inland rate) will in future be refunded on application. In the United States the practice is where the ship desired to be communicated with cannot be reached that the entire amount of toll, including the inland charge, is refunded to the addressor. This plan, however, is unjust to the land companies, which while performing their portion of the service satisfactorily, subjects them to frequent annoyance, involving loss in money and labor and time. The practice enables unscrupulous persons to take undue advantages of the situation—chances, so to speak, of reaching friends, knowing that in the event of failure they would not be out of pocket by the transaction, the burden of responsibility being placed upon the telegraph company. The English Government takes a proper view of the matter, compelling the sender to pay the land line charges. The commercial companies in the United States in justice to themselves should adopt the English plan.

New Postal Office at Cedar Rapids, Ia.

The new office of the Postal Telegraph-Cable Company at Cedar Rapids, Ia., is a model in its way, and fully meets all demands on the company incident to a city of 33,000 inhabitants. It is located in the building of the Montrose Hotel, one of the finest hostelries in the West, at 219 Third avenue, a fine business thoroughfare. The position is a central one, closely adjacent to the post office, two blocks from the Union railway station, and about the same distance from the wholesale business district. The appointments of the office are first-class in every respect, the term modernity applying to all fixtures and apparatus installed. The staff employed at the present time includes J. R. Rose, manager; M. J. Supple and C. A. Bruch, operators, together with four messengers.

Telegraph Age is headquarters for electrical and telegraph books. Write for catalogue.

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Death of John Mitchell.

John Mitchell, one of the best-known telegraphers in this country, and for many years night manager of the telegraph department of the New York Herald, died at his home in Brooklyn on November 3. His death was due to Bright's disease and other complications which confined him to his bed for three weeks prior to his passing away. His health, however, had not been good for some time past.

Mr. Mitchell was born in St. John's, Newfoundland, September 21, 1853, and was educated at St. John's College, St. Bonaventure, and at St. Dunstan's, Charlottetown, Prince Edward Island. He entered the employ of the Anglo-American Telegraph Company when a boy and was in charge of one of its cable stations while still in his teens. He came to New York in 1878 and soon won a reputation as an expert telegraph operator. Natural executive ability placed him in the front rank of the telegraphers' organization here and he was its chief, with the title of master workman, when the strike of 1883 began.

Mr. Mitchell was associated with the publisher of Telegraph Age in the establishment of this paper in 1883, but his continuance in journalism was of comparatively brief duration. He was at heart a telegrapher, and he soon returned to that occupation, finding employment with The United Press at Auburn and at Newburgh, N. Y. Mr. Mitchell was a man of generous sympathies, seldom refusing a call made upon him for assistance, and many stories are told of the helping hand he so freely extended. His connection with the Herald dated from 1893. During the fifteen years in which he was thus engaged the really fine executive qualities of the man were brought to their full fruition in his management of the telegraph department of that journal. He was intensely loyal to the business that dominated his very existence.

When the Spanish-American war came Mr. Mitchell was one of the first men to be sent by his newspaper to the zone of hostilities, and in the earlier days of the conflict in the West Indies he rendered important services to the Herald in getting through to New York the news of the various happenings of world interest in that part of the globe, for it must be remembered that the limited cable facilities groaned under the weight of the enormous trade unexpectedly thrust upon them, the business being from two to three days behind. It was immediately after the battle of Santiago and again after the destruction of Cervera's fleet by Sampson and Schley, however, that he performed his greatest achievements. During those days Mr. Mitchell was stationed at Kingston, Jamaica, between which port and the actual scene of conflict at Santiago the Herald's tugboats carried frequent dispatches, as events at the front warranted.

On the night after the land battle before Santiago and again on the night following the destruction of the Spanish fleet as it sought to escape from Santiago harbor, Mr. Mitchell obtained possession of the two cables out of Kingston, one by way of Panama, Colon and Galveston, and the other via Bermuda and Halifax, and sent thousands of words descriptive of the day's historic events over them.

As a result the Herald on the following morning was able to print the only complete stories of the great American victories on land and sea that were printed in any newspaper in the world. The cost of the messages in each case was not far from $9,000, or the maximum rate of about $1.50 a word. Mr. Mitchell, in a private message to the Herald, informed the management of that paper that Cervera's fleet had been destroyed and that he would "burn" the paper's money that night if necessary in order to get the details of the news through. The zeal and enterprise displayed by Mr. Mitchell on this occasion in serving Herald interests was much appreciated by his employers, who, indeed, throughout his long term of service, held the intrepid operator in high esteem.

Mr. Mitchell was the embodiment of the successful all-around newspaper telegrapher, for he was not only an expert cable and land line operator, inclusive of the wireless system, but was also an able journalist.

When wireless telegraphy was still new Mr. Mitchell successfully superintended the work of demonstrating its commercial possibilities which the Herald conducted in its ship news service from Nantucket. In the summers of 1907 and 1908 he was in charge of the wireless news service on the Herald's despatch boats which accompanied the New York Yacht Club on its annual cruises, handling stock market reports and other important news for the benefit of the yacht fleet and sending to New York the results of the daily sailing contests and other news of the yachtsmen.

During the telegraphers' strike of 1907 Mr. Mitchell, who had great influence in the councils of their organization, declined office repeatedly. He made an address to the assembled operators in New York, which did much to win sympathy for the conservative element and defer a general strike. He also organized relief projects for the families of indigent strikers.

Mr. Mitchell was married in 1884, to Miss Minnie E. Swan, of New York, a prominent telegraph operator of those days, who survives him, together with a son, who is married, and by three daughters. The interment was at Washingtonville, N. Y.

Obituary Notes.

Charles L. Whelpley, a member of the United States Military Telegraph Corps, died in Washington, D. C., November 3, aged sixty-five years. Mr. Whelpley was one of the beneficiaries of the military telegraph pension fund adopted recently by Mr. Carnegie.

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Professor William Edward Ayrton, F.R.S., one of the foremost electrical engineers of England, died in London, November 8. He was born September 14, 1847. He studied electrical engineering with Lord Kelvin and became prominent in the telegraph service of India, reaching the post of electrical superintendent. He held professorships in various institutions, including that of natural philosophy and telegraphy at the Imperial College of Engineering, Japan. He was president of the Physical Society, England, 1891-'92, and president of the Institution of Electrical Engineers in 1892. In 1904 he was dean of the Central Technical College, and in 1905 he was lecturer for the British Association at Johannesburg, South Africa. He was a voluminous writer on scientific subjects and an inventor of note.

R. R. Haines, formerly and for many years manager of the Postal Telegraph-Cable Company at Los Angeles, Cal., died at that point November 6, at the age of eighty-two years. He was born in Maine and entered the telegraph service in 1848. In 1857 he went to California, and after working as a telegrapher for some time, was promoted to be assistant superintendent to the late James Gamble. Mr. Haines was one of those who took part in the Russo-American overland telegraph scheme projected in 1865 by the Western Union Telegraph Company. His experiences, written by himself, incident to his connection with this expedition, were printed in detail in Telegraph Age April 1, 1903. For several years past Mr. Haines has been practically retired from active service in the telegraph.

Following a stroke of paralysis suffered by Mrs. Dunning, wife of J. E. Dunning, the well-known old-time telegrapher, of Paterson, N. J., on September 13, her condition steadily became worse, until on Tuesday, November 10, when she passed away. The funeral occurred on Friday, the thirteenth instant. Mrs. Dunning was a most estimable woman, possessed a fine personality and had a large circle of friends by whom she was greatly beloved. Both Mr. and Mrs. Dunning were wont to be regular in their attendance at the reunions of the Old-Time Telegraphers' and Historical Association, among whose membership none were held in higher esteem.

Another Instance of Good Telegraph Service.

So much criticism is made in these days respecting the slowness of the telegraph that it is refreshing to hear something public stated commendatory of the service. According to an Oklahoma paper it appears that a firm of cotton dealers in that western town sent a message by the Postal Telegraph-Cable Company of Texas, to a cotton exchange house in New York, the same being filed at 1:50 in the afternoon. In exactly four minutes, namely, at 1:54, a reply was received. A second message was dispatched at 1:58, to which an answer came in three minutes, at 2:01. In both instances the answering messages were filed for transmission following a delay occasioned by the execution of an order on the floor of the Cotton Exchange, the objective point of the telegraph circuit. Both messages were sent via Dallas, Tex., the only point of relay on the route. The ordinary time of transmission of telegrams of this character, between the points named, is from six to ten minutes, although a five-minute exchange of messages is frequent. In the incident referred to only normal wire facilities were maintained, "rush it along" being enjoined simply. Such speedy work, however, reflects credit upon the telegraph system.

Mr, English Confers with His Managers.

The regular annual meeting of the managers of the Postal Telegraph-Cable Company of Texas, was held at the executive headquarters of the company at Dallas, Tex., on Saturday, October 17. This assembling of managers is had for purposes of conference with General Manager S. M. English, called with a view of promoting better service, to secure a better understanding of things necessary which will conserve the interests of customers, and things which will tend to a closer affiliation with all officers, from highest to lowest. The managers, who were received as guests of the company, met in the auditorium of the Commercial Club, with Mr. English. The session was executive in character, during which "Betterment of the Service" was the main topic of discussion. In the evening the visiting telegraph men were entertained at dinner by Mr. English at the Southland Hotel, after which all attended the theatre. The stay at Dallas was prolonged over Sunday and Monday, time being employed in automobiling and sight-seeing, visiting the Texas State Fair, also as guests of the telegraph company, the instructions being to forget business and have a good time.

Those present at the conference were: F. C. Cole, Galveston; J. D. McClelland, Houston; W. E. Herring, San Antonio; A. G. Steele, Waco; W. Y. Nolley, Fort Worth; H. E. Sims, Paris; P. R. Napier, Sherman; J. Coffer, Oklahoma City; O. M. Lowe, Little Rock; J. W. Gilliam, Fort Smith; J. I. Hendricks, Shreveport, coming from abroad, the Dallas office being represented by S. M. English, general manager; W. A. Logan, special agent; J. Q. Pipkin, chief clerk auditor's office; W. L. Jones, manager, and S. S. Scothorn, chief operator.

The affair was as successful as it was delightful, and in its conception and consummation reflected the good will of General Manager English toward his subordinates, a friendly feeling that has dominated his administration and done much to advance its success.

Orders for books on telegraphy, wireless telegraphy, telephony, all electrical subjects, and for cable codes, will be filled by Telegraph Age on the day of receipt.

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LETTERS FROM OUR AGENTS.

PHILADELPHIA, POSTAL.

The office in the produce and fish district, which was located at No. 9 Spruce street, has been moved to 105 Dock street. The new office is located in the heart of the district. Credit is due Charles E. Stump, who has been manager of the telegraph office in this district for thirty-five years, for securing such a desirable location.

The new office is up to date in all respects, having the latest style Skirrow patent switchboard and is lighted by the new tungsten lights. Six duplex sets and one single wire have been installed. There is also an anti-room off the office, which furnishes a suitable cloak and supply room.

Mr. Robert Mecredy, manager of the office in the Commercial Exchange, who has been confined to his bed with rheumatic gout for ten days, has returned to duty.

NEWPORT, R. I., WESTERN UNION.

This company has taken a lease of the Ferretti Building, at the corner of Thames street and Sayers wharf, for a term of ten years, possession dating from November 15. The new office is being equipped in an up-to-date manner with modern improvements, including a room for newspaper correspondents. This company has occupied its present quarters since 1873. Its first office in Newport was on Green street. Here James D. Proud was manager, and William Crapo and James Ingraham were operators. Headquarters were later established in the Kinsley express office, on Thames street. It was this express company that built the first telegraph line from Newport to Fall River, at which time and for many years thereafter it was an "other line" office, the rate from New York being 40 and 15. When the office was moved into the Cottrell Building, which it has occupied for more than thirty years, George W. Flagg succeeded James D. Proud, who was the first manager. Mr. Flagg was succeeded by W. A. Harris, of New Haven, to be followed by Thomas J. Smith, of Rochester, N. Y., and subsequently upon his death, by George L. Ferrin as acting manager for about a year, then by Allan Woodle as manager for a short time and last by Harvey J. Lockrow, the present incumbent. The operators, as far back as 1871, were James C. Robinson, of Biddeford, Me., and George L. Ferrin, of Concord, N. H., the latter having remained in the service consecutively and almost in the same chair for thirty-one years. In those early days it may be observed personnel counted for something. Charles T. Bliss, who was the bookkeeper at that time, is still with the company in Newport, and is the only one left of the famous well-known four, Messrs. Robinson, Flagg, Ferrin and Bliss.

NEW YORK, POSTAL.

This office handled an enormous amount of press matter and other telegrams on the night of the election. So perfect were the arrangements under the management of F. F. Norton and his able staff, that not a hitch or delay of any kind occurred. It must have been gratifying to the executive department to have observed the loyal and willing spirit displayed by the operating force who worked under such tremendous pressure.

A. J. Collier, a former manager at Yonkers, N. Y., has been assigned to this office.

W. R. Cox has resigned to go South.

Another resignation is that of Miss H. V. Cunningham, long in this department, who is soon to be married.

The Associated Press and **Hearst News** have been using the "Royal Standard" with splendid results for some time past. The Royal, a hundred-dollar value at sixty-five dollars—just what the telegrapher has wanted for thirty years. Rents at three dollars monthly. Write me for free trial. D. A. Mahoney, Royal Typewriter Company, New York.

OTHER NEW YORK NEWS.

Assessment No. 484 has been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of James W. Hill, at New Orleans, La.; David L. Sullivan, at Wellsville, N. Y.; George B. Gaines, at Fairmount, Va., and Martin L. Hellings, at Devon, Pa.

Attention is again directed to the regular meeting of the Telegraphers' Mutual Benefit Association of New York, which will be held at four o'clock on the afternoon of Wednesday, the 18th inst., at 195 Broadway.

New York Telegraphers' Aid Society Entertainment.

The reception and entertainment of the New York Telegraphers' Aid Society, held Tuesday evening, November 10, at the Lexington Avenue Opera House and Terrace Garden, was both a highly enjoyable and a very successful affair. The occasion marked the twenty-seventh annual meeting and attracted a large number of the telegraph fraternity, men and women, and their friends. There was good music, and a high-class vaudeville entertainment was presented. The concluding hours of the evening were given over to dancing, and this was kept up until late. As the proceeds of these yearly events are devoted as a contribution to the relief fund, maintained as an auxiliary of the society, to aid sick and needy telegraphers, it is gratifying to note that the large attendance may be accepted as an assurance that this humanitarian purpose will be successfully carried forward this winter. The thought and determination that underlies these events, providing for the amelioration of the sufferings of others, is worthy of all praise, and too much commendation cannot be bestowed upon those who work diligently to make this accomplishment

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possible. The affair just concluded will rank among the best of the kind heretofore held in the long series.

Chinese Government Takes the Telegraph.

Advices from Shanghai, China, state the unwisdom of the Chinese government in taking over at the present time the system of telegraphs which now covers the provinces is a leading topic of discussion and criticism in Chinese society. Most persons agree that the forced transfer of the telegraphs to the Chinese government is a high-handed act, and there is a strong tendency to attribute the desire to possess them to the fact that they have proved remunerative. It is freely stated that the government cannot leave possible sources of revenue unexploited.

At the request of the telegraph adviser of the Board of Posts and Communications, Cheng Pi, the president of the board, will establish a factory in Tientsin for the manufacture of all the material which is likely to be required for extensions of the telegraph system which are projected, and which the impending nationalization scheme will involve. It is expected that the new lines and extensions which are contemplated will involve 10,000 miles.

A United States consular report states that 22,419 miles of telegraph lines were operated by the Imperial Chinese Telegraph Company in 1906. The system has 34,473 miles of wire, a submarine cable of 946 miles and 379 offices, of which sixty-two were open day and night, and three hundred and seventeen for day service only. The number of instruments was 768. At the head office in Shanghai the staff numbered sixty-seven, and the general staff 3,175, while inspectors, linemen, etc., brought the total up to 3,400.

The Chinese language being syllabic, and not alphabetic, many may wonder how a message is transmitted. The method is simple but ingenious. There are as many characters as words in the Chinese language, and the messages are sent in number cipher. When the numbers are received at the other end a double-ended type is used, with numbers at one end and characters at the reverse. A message is set up by the numbers and then printed from the reverse end, which shows the characters.

M. J. Reidy and D. J. O'Brien, two Boston telegraphers, were elected members of the Massachusetts State Legislature at the recent election.

Fire in the central telegraph office at Brussels, Belgium, on October 22, stopped all telegraphic communication between Brussels and the provinces and foreign cities. It required ten days to restore the telegraph system. The spread of the fire was so rapid that the employes became panic-stricken, but no one was injured.

It is contemplated to set up a telegraph line to the top of Monte Rosa, Italy, a height of 4,538 meters above sea level. It will be afterwards extended to the observatory on the Col d'Ollen, then to the Margherita-Hütte, near the summit. The erection of the poles in the snow and ice region will be attended with great difficulty.

The stealing of copper telegraph wire is apparently as frequent an occurrence in England as in this country. Since August last 4,000 yards have been stolen from the Midland Railway and 700 yards of the London and North-Western wire. Six detectives were assigned to the case, and two men were caught red-handed.

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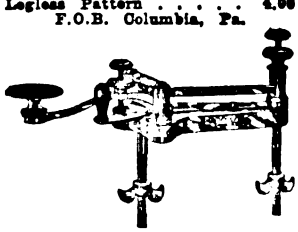

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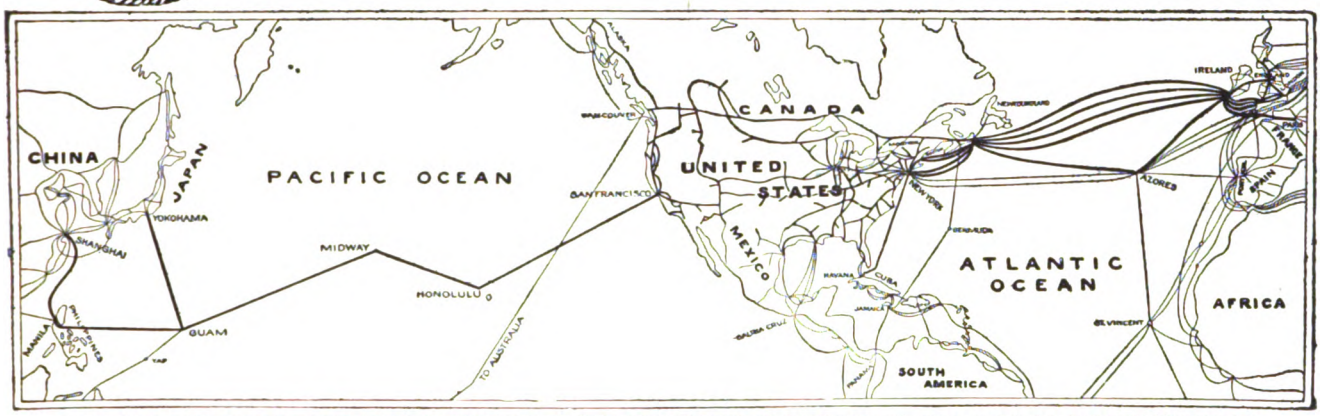

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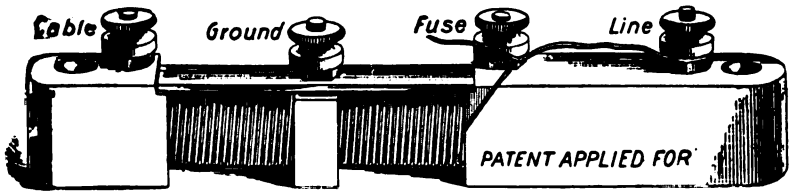

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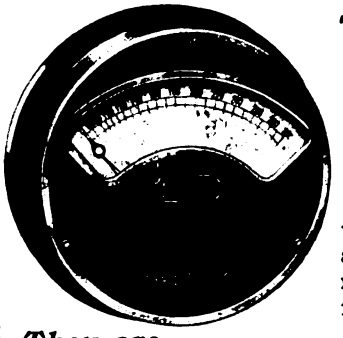

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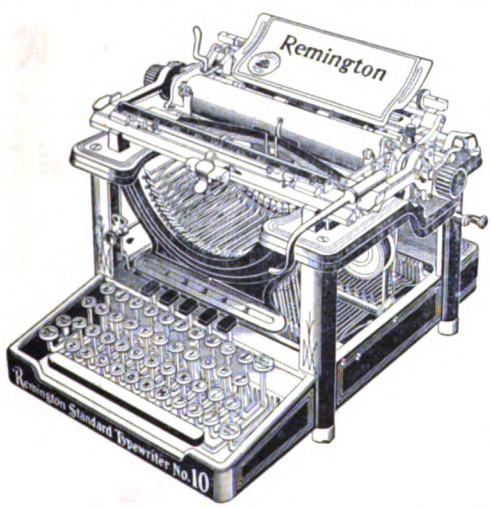

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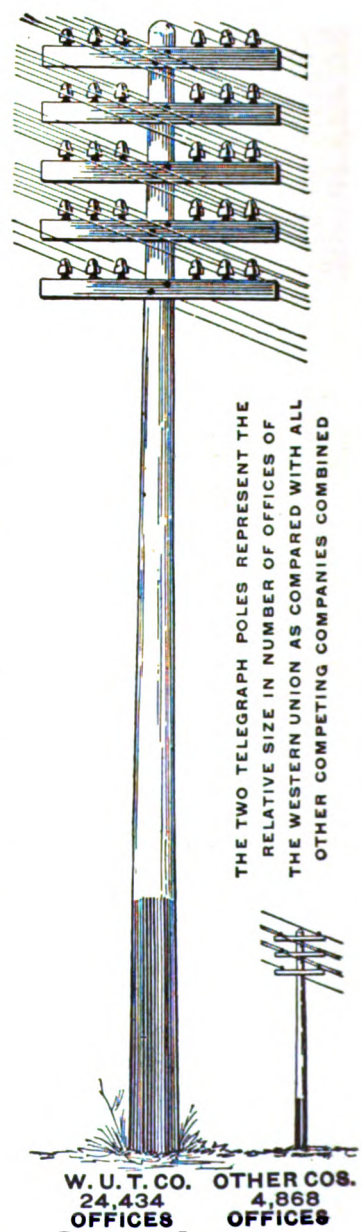

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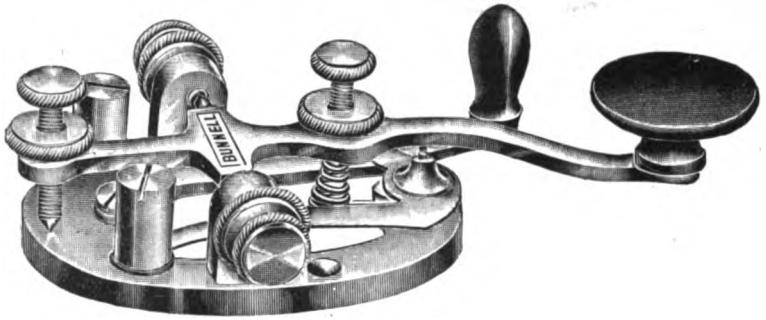

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SOME POINTS ON ELECTRICITY.

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Elementary Lessons Concerning the Operation of Repeaters.

(PART III.)

As the reader will have already learned from the description of various repeaters in the preceding installments of this article, the successful operation of each type depends upon a holding magnet, or, in some cases, a circuit shifter, in order to become automatic in action.

In addition to the dissimilar methods employed by Wood, Milliken and Horton in their repeaters, already described, there are yet several other ingenious arrangements which accomplish the same purpose, one of which is the well-known Weiny-Phillips repeater. Figure 1 shows just enough of the apparatus to illustrate the principle involved in the operation of the holding device without giving the actual wire connections. Both transmitters are purposely omitted and the two line wires are shown connected through the relay contact points instead of through the tongue of a transmitter, as is really the method in actual practice. This is merely to simplify the diagram.

It will be seen that in this repeater the extra magnet is placed just above the relay magnet and on the same side of the lever as the latter. Also, that one lever suffices for both magnets. The little magnet is energized by a local battery and the relay magnet, of course, by the main line current. As a current of electricity normally flows through both magnets when both relays are closed,

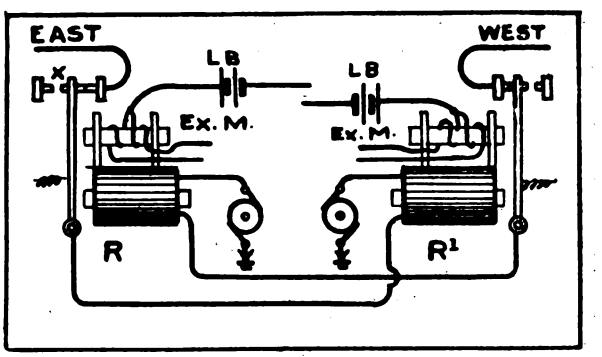

FIGURE 1.

it is necessary that the two iron cores of the respective magnets shall not both be magnetized at the same instant and thereby tend to actuate the common lever simultaneously instead of alternately, as may be required.

The manner in which the inventor gets around this difficulty is as follows: The little magnet is wound differentially, after the manner of a multiplex relay. When both relays are closed the

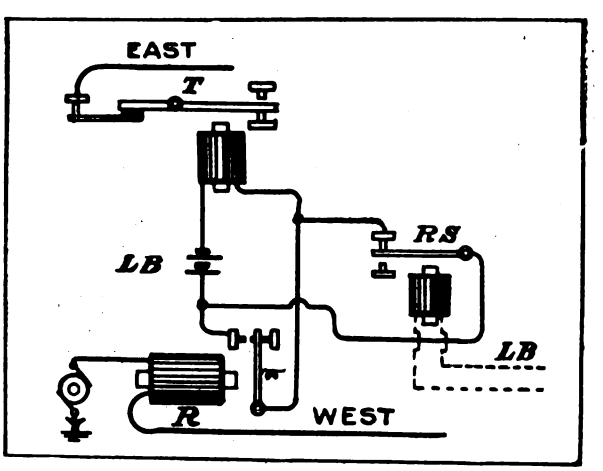

FIGURE 2.

local connections are such that the current divides equally between the two coils of the little magnet, but as the two volumes flow in opposite directions, there is, of course, no magnetic effect on the core of the little magnet.

If, however, one of the main line circuits should open, the consequent opening of the contact points

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of the relay and the transmitter it controls, immediately opens one coil of the little magnet. The result is that the companion coil in the latter now unopposed by its mate instantly magnetizes the iron core and holds the lever closed until the core of the relay just below it again becomes energized and resumes duty.

If the reader will glance at the diagram he will readily see that in the event of relay R becoming demagnetized through the opening of the western circuit the eastern wire will not be opened at contact point X, and thereby open relay R^1; also because the little magnet holds the lever fast during the critical moment.

In most repeaters the extra magnets cannot act until the levers which close their local circuits first cross the space between the front and back contact points. A break therefore is not quite instantaneous. In the Weiny repeater the holding magnet becomes effective the instant the lever starts to fall back and for this reason it is probably the quickest acting device employed in the capacity of a holding magnet.

In the Atkinson repeater, probably the most popular type used by the Western Union Telegraph Company, the method employed to keep the transmitter points through which the companion main line wire runs closed at the critical moment, is to utilize the tongue or lever of a repeating sounder to complete and substitute an extra path or shunt around the contact points of the relay when it opens, and thus prevent the local battery circuit containing the transmitter magnet from opening. The same apparatus and connections, of course, constitute the companion half of the repeater. (For complete diagrams of this and other repeaters described see Jones' Pocket Edition of Diagrams.)

Figure 2 shows the arrangement of the local battery circuit containing one transmitter, together with the tap connections therewith through the lever of the repeating sounder. The repeating sounder is controlled by one end of a companion transmitter in the other half of the repeater outfit, not shown in the diagram.

It is quite evident that if the contact points of the repeating sounder are set close together, or, in other words, the lever be given a minimum play, the action of the repeater should be very rapid; while the operation of adjusting such a repeater is the same as if when adjusting an ordinary Morse relay.

We have probably given a sufficient number of illustrations to afford the student a general idea of the operation of single line repeaters, yet there are a number of other arrangements which are equally as ingenious and efficient. In every case, however, if one wishes to learn the action of any particular pattern or make of repeater quickly, let him first direct his attention to the "holding magnet" and ascertain how it is controlled.

In the next installment of this article we shall show how repeaters that connect single-wire circuits with multiplex circuits are constructed and operated; also, how two multiplex circuits are repeatered.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 902,792, for a type-printing telegraph apparatus, has been granted to Gustav A. M. Agrell, of Stockholm, Sweden. A telegraph apparatus of the type having a movable type wheel provided with means for moving it to printing position and then to a certain starting position after the typing action.

A patent, No. 903,195, for a testing galvanometer, has been awarded to Harry T. Johnson, of New York, and Charles E. Avery, of Jersey City, N. J. A flat magnet core is disposed in a horizontal central position relatively to the needle and has a greater width at its center than at its ends.

The following patents have expired:

A patent, No. 462,901, for duplex and quadruplex telegraphy, held by F. W. Jones, New York.

Patent No. 463,428, for a telegraph sounder, held by J. Maret, of Mount Vernon, Ky.

Personal.

Mr. W. P. Cline, of Wilmington, N. C., superintendent of telegraph of the Atlantic Coast Line, accompanied by his wife, spent several days in New York last week.

Mr. Theodore N. Vail, president of the American Telephone and Telegraph Company, New York, sailed for Europe a few days ago to spend a vacation abroad and probably will be absent for two months.

The Study of Telegraph Engineering.

Mr. W. N. Fashbaugh, electrician of the eastern division of the Western Union Telegraph Company, New York, makes this contribution to the series of letters, the publication of which was begun in the issue of November 1, written by men who have attained promotion to high position in the service, and who are competent to give the advice which they do:

For the young operator wishing to fit himself for advancement in the electrical department of the telegraph I would suggest a thorough study of the fundamental laws of electricity and magnetism, the reading of publications explaining the various applications of electricity for commercial purposes, an electrical course in a correspondence school and if residing in New York or vicinity, the attendance at the free lectures on electrical subjects which are given in the public schools.

This should give him a theoretical knowledge of great assistance in an understanding of the practical working details, construction, principles of operation and maintenance of telegraphic systems and apparatus which he is called upon to handle from day to day.

You can't afford to be without Telegraph Age; $2 a year.

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Radio-Telegraphy.

The covering by wireless telegraphy by press messages of the wide ocean span between San Francisco and Hawaii, an interval of 2,100 miles, marks a gratifying advance in the successful working of that system over long distances. This has been made possible in this instance by the new and powerful wireless station recently erected at San Francisco. By its means communication was also established at numerous remote points on the Pacific Coast and even with vessels, it is said, in the Behring Sea.

The signal service wireless stations in Alaska have made another record, removing all doubt as to the feasibility of sending wireless messages overland. Fort Gibbon, several hundred miles inland, is receiving messages from Nome and St. Michael, five hundred miles distant, with many ranges of hills between the two stations. A message sent by the steamer Northwestern 1,100 miles west of Cape Flattery to the United Wireless station at Cordova was copied. The message traveled about 1,200 miles in an air line over two ranges of mountains, capped with snow.

The Navy Department will shortly issue invitations for bids for the construction of a powerful long-distance wireless telegraph station. A mast is to be constructed in or near Washington three hundred and fifty to four hundred feet high, and it is expected to be able to get into touch with vessels three thousand miles distant. In the same advertisement bids will also be asked for two wireless ship equipments that will have a radius of one thousand miles. The new station will also be used for thoroughly testing the long-distance systems. If successful, the new high-power station may eventually supersede many of the stations now along the Atlantic Coast.

Mr. John Hesketh, chief electrician to the Commonwealth Government, Australia, in giving evidence before the Postal Commission in Melbourne, on September 30, stated that in his opinion wireless telegraphy was not justifiable for commercial use in that commonwealth; tenders for wireless stations had been invited, in order to ascertain their cost, and the Defence Department and the Postmaster-General's department recommended installations at Fremantle, Sydney, Cape York, Thursday Island, Port Moresby, Melbourne and Cape Borda. The traffic between Victoria and Tasmania was sufficient to keep two cables working on the duplex system, and was beyond the capacity of wireless telegraphy.

A cablegram from Paris, under date of November 23, states that Bellini and Tosi, two Italian scientists, who have been experimenting in wireless telegraphy for eighteen months on the Normandy coast, announce that they have solved the problem of independent wireless communication. This result, they say, has been secured by means of two rectangular aerials fixed at right angles and so attached to the apparatus for receiving and transmitting as to permit the transmission of unequal currents. By a simple law of mechanics those two electromagnetic forces unite and produce an electro-magnetic field and the Hertzian waves are projected in a single vertical plane which can be alternated instantly by means of the Bobine device. The inventors have picked up messages at will from every English wireless station and from ships at sea and have transmitted messages from Pourville to Havre and other points without the waves being perceptible at stations just off the line of transmission. Among the advantages that their discovery will add to wireless telegraphy they mention the determining by triangulation of the exact position of a ship in distress, the position and speed of a hostile squadron and the reading of secret exchanges between friendly fleets and armies.

The Cable.

The new German Cable Company formed to lay cables between Germany and Brazil via Teneriffe, will announce its adhesion to the International Telegraph Convention during the summer of 1909.

Cable communication is interrupted November 28 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3. 1908
Macao	Aug. 29, 1908
Messages can be mailed from Hongkong.	
Hayti	Nov. 23, 1908
Private messages for the interior not accepted.	

Foreign Telegraph Statistics.

The report of the postmaster-general of Southern Rhodesia, Africa, on the telegraphs in that colony for 1907, shows that of telegraph lines there were 3,647 kilometers of line and 6,696 of wire, while in the Bechuanaland Protectorate there were 947 kilometers of line and 2,983 of wire. The government constructed a line of 39 kilometers in length on iron poles between Insiza station and Myati, and was also erecting a line between Blinkwater and Felixburg, 38 kilometers in length.

The telegraph system in the Transvaal in 1906-7, increased by 282 kilometers of line and 49 kilometers of wire; 4,011 and 15,729 kilometers of line and wire were aerial, while 8 and 224 kilometers were subterranean. There were 254 offices open to the public—an increase of 12 over the previous year. Of the offices, 128 belonged to the railway service.

The telegraphic system of the Island of Ceylon grew in 1907 by 81 kilometers of line and 292 kilometers of wire to a total of 2,743 kilometers of line and 5,878 kilometers of wire.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.

(Part XII.)

THE RECEIVING APPARATUS—CONTINUED.

PRINCIPLE OF OPERATION.

Before entering into a more detailed description of the receiving apparatus and its modus operandi, it may be well to give the reader some general idea as to how it is possible by means of the signaling impulses to so control the operation of the printing magnets, that any combination of the fifty-eight different characters in use may be automatically impressed upon the regular blanks provided for the reception of messages.

It has already been stated that for each letter or character to be printed, six current impulses, alternately positive and negative, and varying in length, are employed. These positive and negative impulses, whether of "dot" or "dash" duration, are intended primarily to operate a polar relay, the armature of which, as it oscillates to and fro, controls an escape-wheel, to which a step by step movement is imparted.

In the course of its rotation, this wheel is made to successively close a gap in each of the local circuits of as many electro-magnets as there are line impulses, and in the specific order in which these impulses arrive over the line. Five of these electro-magnets—known as "distributing relays"—are utilized for the purpose of selecting, or setting up, certain "combinations," the character of which is such, that the circuit of every printer magnet, except the one to be energized, will stand "open" by the time the fifth pulse has reached its destination. At that identical moment, the circuit of the one printer magnet whose operation is desired will be "closed," so that when the sixth, or what might be termed the "printing pulse," arrives and completes its work, a character representing the particular combination of pulses contained in the signaling series will be duly impressed upon the message blank.

In order to effect these combinations, it is necessary that in every series of the six transmitted impulses, one or more of said pulses should have a period equal to that of "dash" duration. The short pulses (those of "dot" duration) do not affect any of the distributing relays, which, it may be remarked, are really brought into action through the medium of an interposed neutral, or "separator" relay, adapted to respond only to the long line impulses, and through whose contact points the local current for energizing either of the distributing relays is permitted to flow at the proper moment.

A better understanding of the principles involved may perhaps be obtained by reference to Fig. 37, where the printer relay (whose armature movements correspond with those of the main line relay) is represented as controlling two branch circuits containing the separator relay, the escapement magnet, and a synchronizing magnet, each of which is provided with two separate and independent coils.

The separator relay is of the neutral or non-polarized variety, and its armature spring is adjusted so as to make the relay indifferent to the short current impulses, but responsive to those of longer duration, whether in a positive or negative direction.

The escapement magnet, being of the polarized type, is actuated by currents of either polarity, long or short, that are utilized to release an escape-wheel and unison wheel (which normally tend to rotate under the influence of an electric motor) and by imparting thereto a step by step movement successively close the contact points of the pivoted levers numbered from 1 to 6 in the accompanying diagram.

This combination of escape-wheel and magnet, unison wheel with contact levers, and synchonizing magnet, is generally known as the "sunflower;" a term, however, more properly applied to that portion only of the apparatus comprising the rotating mechanism with its group of circuit-closing levers.

The synchronizing magnet is also of the polar type, but differs from the regular class of polarized apparatus in that only the iron cores of this instrument acquire polarity from the inducing magnet, an arrangement commonly known as the "Hughes" form of electro-magnet.

The winding of this electro-magnet is such that a current traversing either of its coils in the proper direction, will increase the amount of magnetism already in the core, whereas a current in the opposite direction will diminish, or tend to neutralize its magnetic value. In the case of the synchronizing magnet, the induced magnetism is assisted by the kind of polarity developed from the regular spacing (positive) currents, and opposed by that developed as a result of the marking (negative) currents. As the synchronizing armature spring is normally adjusted to withstand the tendency to vibrate under the influence of the shorter pulsations, and inasmuch as the long marking pulses are not of the right polarity to magnetize the soft iron core, it will be evident that only the long spacing impulses are adapted to bring the synchronizer into service.

Now, a long spacing pulse invariably occurs at the end of each letter, and this is utilized to energize the synchronizing magnet, the particular function of which is to so act upon the unison, or correcting wheel, that in the event of the latter being out of step with the incoming pulses, it may be quickly restored to the unison or zero position, from which point a fresh start can be made with any new series of line impulses. The method of accomplishing this will be understood by reference to the figure where, as will be seen, the

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escape-wheel is provided with forty-five teeth, and the unison, or correcting wheel with fifteen teeth; a ratio of three to one. As these two wheels are on the same driving shaft, and normally tend to rotate by the power derived from the electric motor, a step by step motion will be

one tooth (or rather the space between two of its teeth) in the case of the unison wheel. On the end of the synchronizing lever is a hook that is normally adjusted to rest in the spaces between the teeth of the unison wheel; hence the latter, in the course of rotation, would bring

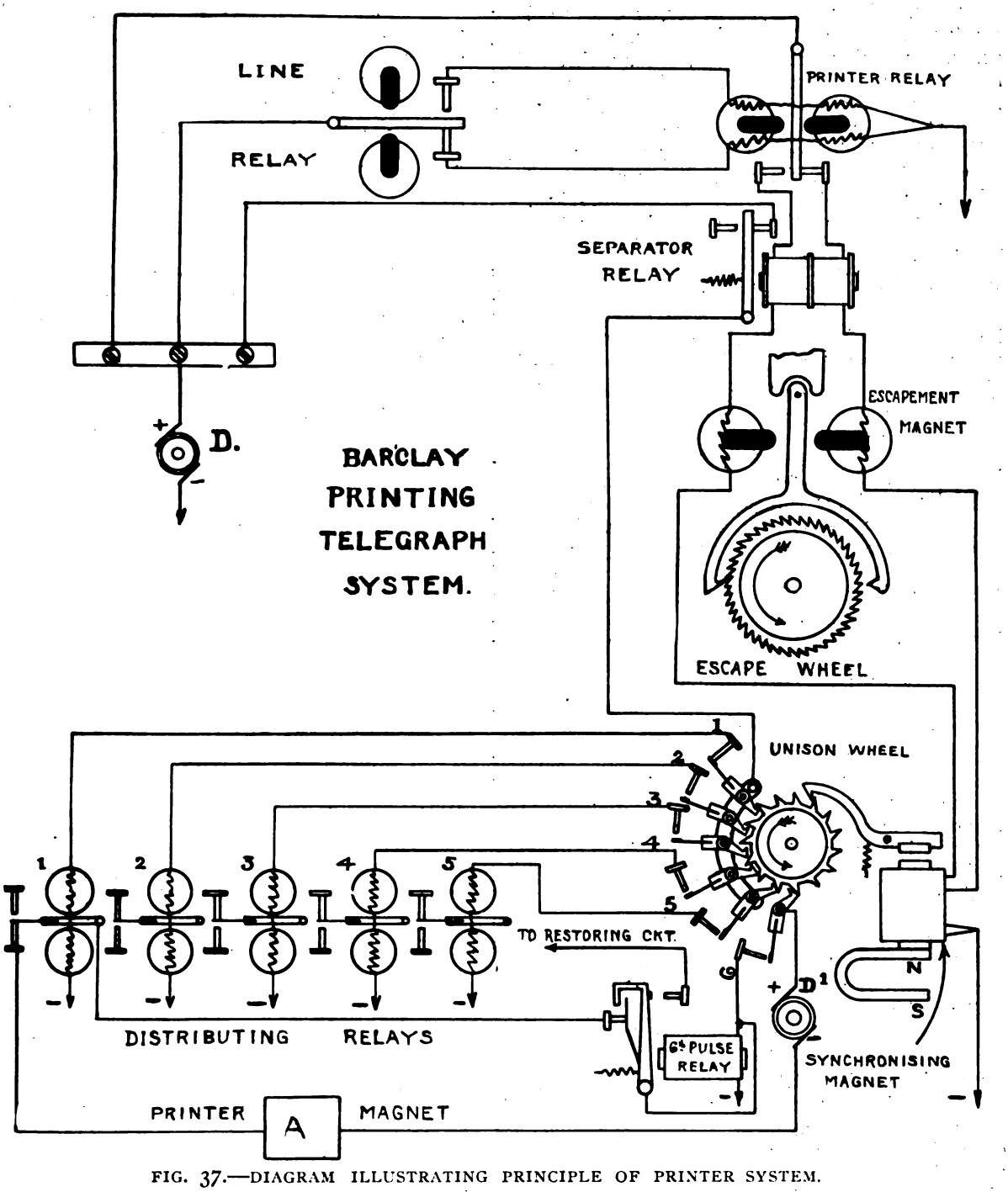

FIG. 37.—DIAGRAM ILLUSTRATING PRINCIPLE OF PRINTER SYSTEM.

communicated to both wheels by the action of the escapement magnet, and thus turn them through the same distance for any series of six line impulses, this distance being represented by three teeth in the case of the escape-wheel, and

some tooth or other into contact with the hook and thereby arrest the motion of the wheel, but for the fact that at the moment this would otherwise occur, the synchronizing armature is attracted by the long spacing pulse and the hook

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thereby removed from the path of the tooth. So long, therefore, as the line impulses remain intact, this action on the part of the hook in getting out of the way of the teeth at the end of each series of pulsations, will permit both wheels to continue their rotary step by step motions in correspondence with the alternations of the incoming impulses. This unison, however, is destroyed by the loss of one or more of the current impulses, as, under such circumstances, the synchronizing magnet would not come into action at the proper moment; but a correction is automatically applied at the very first character combination that follows in which there is no long spacing pulse.

It will be observed that the teeth of the unison wheel, as the latter revolves, successively butt against the toes of the six pivoted levers (1, 2, 3, 4, 5, 6), through the flexible points of which electrical connection is established with the five distributing relays and the sixth pulse relay. The circuit of these relays, however, can only be fully completed when the armature lever of the separator relay is on its front contact—that is, whenever a long pulse of either polarity has developed enough magnetism in the core to attract the armature into the position shown.

We will now suppose that the letter "A" is to be printed. The combination of characters arbitrarily fixed for this letter consists of a dash and two dots (—··) in the formation of each of which, two currents of opposite polarity (negative at the beginning and positive at the end of each pulse) are required, or a series of six pulses in all. Since the first of these pulses is a prolonged one, the armature of the separator relay will be attracted at the very moment when, by the action of the escapement magnet, a tooth engages the toe of the pivoted lever No. 1, thereby closing the circuit of No. 1 distributing relay and permitting current from dynamo D to flow through that instrument via the contact points of the separator relay and those of the aforesaid lever. As a result thereof, the armature of No. 1 distributing relay will be attracted to one side, and remain in that position until the end of the cycle of pulses. As all the rest in the series of pulses we are now considering are short ones (with the exception of the last one, which as previously stated is always a long spacing pulse) the separator relay—now in its normal position—will not be actuated, but the escapement magnet will continue its work of turning the escape and unison wheels, and of consecutively closing the remainder of the sunflower points without, however, completing the circuits of their correspondingly numbered distributing relays. Hence, the only distributing relay affected by the combination of line impulses in this particular series is No. 1 relay, which, in this instance, has set up a simple circuit combination through its points that leads directly to the printer magnet representing the letter "A," the circuit of which is fully completed when, upon the arrival of the sixth pulse, the corresponding, or sixth pulse relay is brought into action.

To select the printer magnet representing the letter "K," the character combination of which consists of three dashes (———), the first, third and fifth distributing relays would have to be energized in the manner already indicated, and a more complex circuit arrangement would then be set up and completed through the group of "multiple" contact points with which these relays are provided.

After the selection and printing of a letter, it is necessary that the relay, or series of relays which may have been engaged in that particular work, should be restored to a neutral position, so as to be in a condition of readiness for the next cycle of operations. With this end in view, each distributing relay is provided with an extra winding forming part of a "restoring circuit," through which a current flows from dynamo D^1 as soon as the armature of the sixth pulse relay reaches its front stop at the termination of each series of signaling impulses. This restoring circuit is, for the sake of clearness, omitted from the accompanying sketch, which, for the same reason, does not show the actual disposition and arrangement of the sunflower mechanism, that being reserved for a subsequent article.

(To be continued.)

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Charles C. Adams, second vice-president, spent a few days recently in Philadelphia, his old home, where formerly as manager and subsequently as superintendent of the company he was a resident.

F. G. Waterhouse, vice-president and general manager of the Southern Nevada Consolidated Telephones and Telegraph Company, with headquarters at Tonopah, Nev., was a recent visitor at these offices on business connected with the service.

Another executive office visitor was H. A. Tuttle, vice-president and general manager of the North American Telegraph Company, Minneapolis, Minn. Mr. Tuttle, who usually takes his vacation in the winter, will visit California before returning to his home.

Other visitors were:

Superintendents A. L. Edgecombe, of Boston; H. D. Reynolds, of Buffalo; L. Lemon, of Philadelphia, and Charles E. Bagley, of Pittsburg; C. A. Richardson, manager, accompanied by his wife, and P. J. Farrell, chief operator, of Boston; W. M. Pruyn, manager, and C. C. King, chief operator, of Albany, and T. C. Sydnor, of Richmond, Va.

Mr. F. E. d'Humy, assistant electrical engineer, has been to Chicago and Buffalo on company business.

RESIGNATIONS AND APPOINTMENTS.

Mr. Vail V. Stevenson, chief operator of the Los Angeles, Cal., office, has been promoted to

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the managership, and Mr. J. H. Dorsey, formerly assistant chief operator, has been made chief operator.

Western Union Telegraph Company.

EXECUTIVE OFFICES.

General Thomas J. Eckert, chairman of the board, who has been spending the past summer and fall seasons at his country home at West End, N. J., has returned to the city for the winter and is occupying his fine new residence at 38 West Eighty-sixth street. The many friends of the General will be glad to learn that, although over eighty-seven years of age, he comes back to town reinvigorated, alert and active, by his long vacation.

Recent office visitors from Chicago were Theodore P. Cook, general superintendent; W. J. Lloyd, assistant superintendent, who was accompanied by his wife, and Amos Young, general foreman of construction.

Other visitors were Jacob Levin, general superintendent at Atlanta, Ga., and Isaac McMichael, vice-president and general manager of the Great North Western Telegraph Company, Toronto, Ont.

Frank Jaynes, general superintendent, and I. N. Miller, Jr., assistant general superintendent of the Pacific division, with headquarters at San Francisco, Calif., have completed a tour of inspection in Oregon and Washington. As a result of their trip increased telegraph facilities will be made to the company's equipment in the Northwest. The Alaska-Yukon-Pacific exposition of next year will require additional wire facilities to take care of rapidly increasing business.

Mr. G. F. Swortfiger, assistant general superintendent of construction, together with superintendent of telegraph, W. C. Walstrum, of the Norfolk and Western Railroad, and L. J. Maxwell, superintendent of this company at Richmond, Va., have finished a general tour of inspection of telegraph property over the Norfolk and Western Railroad system.

Mr. A. R. Lingafelt, assistant superintendent at Chicago, has been transferred to Oklahoma City, Okla., where he will act in the same capacity, his jurisdiction extending over portions of three districts.

Mr. George M. Myers, one of the best-known business men of Kansas City, Mo., and a former telegrapher, at one time extensively engaged in telegraph line construction in the far west, and president and general manager of the old Pacific Mutual Telegraph Company, was a recent visitor in New York.

Commendatory of Telegraph Age Teachings.

George J. Frankel, superintendent of the Western Union Telegraph Company at St. Louis, is an appreciative reader of Telegraph Age, in whose columns he appears to find much to commend. In a recent letter, accompanied by an order for a large number of copies of the issue of November 16, he writes:

Your editorial on "Neatness, Order and Discipline in Telegraph Offices," is one that appeals to me, covering as it does, conditions with which we all have to cope, and I wish to distribute the article in question as widely as possible among the managers in my district. Your paper contains so many pertinent articles that it is difficult to say which is the most helpful, but this particular one seems to me to meet a long-felt want.

Municipal Electricians.

Mr. Vernon H. Wetherell has been appointed superintendent of the fire-alarm telegraph system of Danielson, Conn.

The Common Battery Duplex.

BY CHARLES E. HAY.
(In the Post Office Electrical Engineers' Journal, London.)

Before entering into a description of the common battery duplex recently adopted by the British Post Office, it will be as well to review the system formerly in use in order to fully comprehend the difficulty presented by the problem of working duplex from a battery or batteries placed at one end only of a telegraph line, and to indicate the progress which has been made in this branch of common battery working since its introduction some few years ago.

In the original system, a positive and a negative battery were required at the central station for the purpose of sending to line reversals of current which operated the receiving apparatus at the out station, but were not of sufficient magnitude to operate the non-polarized relay at the central station, the armature of the relay being biassed against the currents by means of a helical spring. An increase of current effected by means of the key at the out station shunting the high resistance sounder with a resistance of 1,500 ohms, created a magnetic force in the relay at the central station sufficient to overcome the force exerted by the spring, and therefore operated it. The current in the out station receiving apparatus was not sensibly affected when the shunt was applied, and in consequence the signals were satisfactory in both positions of the key at that station. At the central station, however, when its relay armature was in a "marking" position, a reversal of the current allowed the tongue of the relay to "kick" off the marking stop, causing the current in the local circuit to cease for a short interval of time, and consequently breaking the signals on the local sounder. Obviously this defect was extremely serious, and presented a problem not easy of solution. The manner in which the defect was covered up—it has never been remedied—affords a remarkably interesting example of the value of a knowledge of the laws governing transient currents of electricity. The local sounder is joined up in series with a resistance of 300 ohms, both being shunted with a condenser of eight microfarads capacity. The condenser is charged when the tongue of the relay comes in contact with the marking

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stop, and remains charged as long as they are in contact, but when the tongue "kicks" the condenser is allowed to discharge, and sends a current through the resistance of 300 ohms and the sounder, thereby maintaining the continuity of the signal. The current in the local sounder varies with time from the instant the tongue leaves the marking stop. It will be noted that the current flows through the sounder for 45×10^{-3} seconds after the tongue leaves the marking stop, and is of considerable strength for half that period of time. If, therefore, the time which elapses between the tongue leaving the stop and returning to it does not exceed about 30×10^{-3} seconds the continuity of the signal is not broken, and satisfactory working results. In practice, when the key at the central station is closely adjusted so as to make the time as short as possible in changing from a voltage of one sign to that of another and when the rate of sending is normal, no difficulty is experienced. Owing, however, to the objection of manipulating a closely adjusted key and the impossibility of obtaining a constant rate of sending, this system of common battery duplex was found imperfect, and it was recognized that some other principle of working must be discovered.

The following system devised by the present writer is free from the defect just described, and it has now almost entirely displaced the older system. It differs in every respect from the system it has superseded. One battery only is required, and it is joined up permanently when the circuit is in use. Tumbler switches are provided for cutting off the power when the circuits are shut down.

Normally, owing to the bridge arms being equal, and the resistance of the line together with the resistance of the apparatus at the out station being greater than the 1250 ohms resistance at the central station, a current flows through the receiving apparatus at the latter; and the wiring is so arranged that this current is in a "spacing" direction. When the key at the out station is depressed 1000 ohms is cut out of circuit—one coil of the polarized sounder and the 500 ohm resistance coil—consequently the resistance of the line plus the remaining resistance of the apparatus is now less than the 1250 ohms resistance at the central station, hence the direction of the current through the receiving apparatus at that station is reversed, and, as will be shown presently, its magnitude remains approximately unchanged. The depression of the key at the out station causes the potentials at the terminals of the polarized sounder to change, but it is arranged that their difference remains constant. The receiving apparatus at the central station is therefore operated by reversing the direction of the current in it, while the receiving apparatus at the out station is unaffected. That there is no change in the difference of potential across the polarized sounder at the out station in all positions of the key there, is only absolutely true when the key at the central station is depressed. There is a slight change in the difference when the key at the central station is not depressed, but it is of no material consequence, as the out station apparatus is not then recording a signal.

The depression of the key at the central station joins the battery direct to the split of the polarized relay; the current in the line is therefore increased, and it is this increase which operates the receiving apparatus at the out station. The direction of the resultant magnetic induction in the relay, due to the current splitting differentially through its coils, is not affected, as its components, which are proportional to the currents in the coils, depend entirely on the relation between the resistances on each side of the bridge arms, and, as already shown, this relation is controlled by the operator at the out station. In order to render it unnecessary to bias the polarized sounder at the out station against the permanent current which flows through its windings, it is joined up in such a manner that the magnetic induction in its cores due to the polarizing magnetic force is in opposition to the induction due to the almost equal magnetic force created by the permanent current.

Having described the working of the system, perhaps it would now be of interest to indicate the reason for the selection of the different resistances which are used.

The line is banked up to a resistance of 350 ohms so that all lines within a radius of sixteen miles of the central station may be accommodated (22 ohms per mile being taken as the maximum resistance of wires running into large centers from places which would be worked from a common battery). If the resistance per mile is less than this amount greater distances can, of course, be covered, as the system can stand considerable line leakage and capacity.

The influx of new men in the telegraph service has created an increasing demand for that standard work on the telegraph, "Pocket Edition of Diagrams and Complete Information for Telegraph Students," by W. H. Jones, conductor of the department in this journal bearing the title "Some Points on Electricity." Doubtless, this book is required to "brighten up" telegraphic knowledge, especially of those who are returning to the key after absence therefrom. As the volume was written by a telegrapher, yet in the harness, practically familiar with all the "ins and outs" of an operator's work, it conveys just the kind of information most desired. In fact, a careful reading of the book, which contains 334 pages, and a thorough study of its 160 diagrams, will teach the average operator more about telegraphy in its application to his daily work than he can possibly derive from any other source. The price of this book is $1.50, which includes the cost of carrying charges to any point in the United States. Orders should be sent direct to this office, or to any of our agents who may be found with both the Western Union and Postal telegraph companies in nearly every large center in the United States.

TELEGRAPH AGE will furnish operators with just the kind of practical information they require.

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Mr. Stevenson Postal Manager at Los Angeles.

Vail V. Stevenson, the new manager of the Postal Telegraph-Cable Company at Los Angeles, Calif., furnishes another representative of the type of the progressive young man in the telegraph service. Mr. Stevenson was born near Kansas City, Mo., March 30, 1881. He entered the service as a Western Union messenger boy in 1895. By 1899 he had become an operator for the same company at Los Angeles. Subsequently he entered the employ of the Southern Pacific railroad, later returning to the Western Union as an operator at Phoenix, Ariz., from which he went to Tucson as repeater chief. In these several changes he had shown aptitude as an operator, was careful, diligent, observant and at all times a student. In 1905 Mr. Stevenson was appointed assistant chief operator of the Postal, and in the year following received promotion to the managership of the repeater station at Ashfork, Ariz. From this point he was transferred

VAIL V. STEVENSON.
Manager Postal Telegraph-Cable Company, Los Angeles, Cal.

to Los Angeles as chief operator. His elevation on November 1 to the head of the office advances a young man who has earned his way by the exercise of those qualities that mark the conscientious aspirant.

An American Switchboard for the Paris Telephone Exchange.

The Telephone Exchange of Paris was destroyed by fire on September 20, a disaster that resulted in the loss of property valued at $6,000,000, and completely paralyzing the telephone service of the French capital. An order for a new switchboard, 180 feet in length, to take the place of the one burned, was placed with the Western Electric Company on September 29, the proviso of the contract being that the new board, together with all other apparatus necessary to its equipment, should be delivered in Paris within sixty days, heavy penalties to be exacted in case of failure. The completed switchboard, together with all fixtures, was shipped by rail from the company's Hawthorne works in Chicago. A train of six cars and two days' time was required to convey the material to New York. Transshipment was then made to a French line steamer which sailed on October 29. Thus it will be seen that in less than a month from the date of its receipt, the order had been executed and the manufactured product was on its way across the ocean to its point of destination. Two weeks later the new switchboard was in position. The transaction afforded an instructive object lesson of American resources in general, and of the capacity of the supplying company in particular. Incidentally it may be remarked that the back of this switchboard contained about a million soldered connections and three thousand miles of wire. Approximately 40,000 feet of lumber was used in packing the switchboard, and 10,000 square feet of paraffined paper was used in waterproofing the cabling boxes.

Giant Telegraph Poles.

An instance of setting massive telegraph poles was witnessed on October 15, when M. B. Wyrick, superintendent of construction and equipment of the Postal Telegraph-Cable Company of Texas, successfully placed two poles of unusual dimensions. The trees from which these giant poles were the outcome were cut near Marysville. At Beaumont, to which point they were shipped, they were treated with creosote, twenty-four pounds to the cubic foot. The poles after treatment weighed between eight thousand and ten thousand pounds apiece. One pole measured one hundred feet in length, twenty-two inches at the butt, and ten inches at the top; the other was one hundred and two feet long, with a twenty-four-inch butt and eleven-inch top. These poles are intended for a river crossing and carry five Postal wires, one wire of the Texas Oil Company and fourteen of the Southwestern Telephone Company.

Carnegie's Business Maxims.

To secure promotion, a young man must do something unusual, and especially must this be beyond the strict boundary of his duties.

Aim high. I would not give a fig for a young man who does not already see himself partner or head of an important firm.

Begin early to save. No matter how little it may be possible to save, save that little.

Look out for the boy who has to plunge into work direct from the common school, and who begins by sweeping out the office or store.

Business is a large word and covers the whole range of man's efforts. The same principles of thrift, energy, concentration and brains win success in any branch of business.

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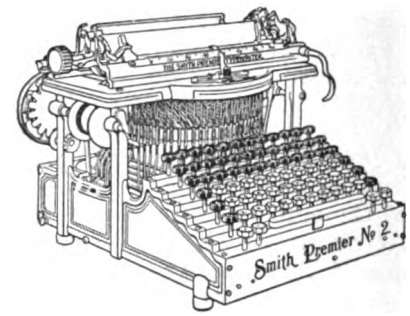
From the Wire TO A Smith Premier Typewriter



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POSTAL OFFICIAL DIAGRAMS.

The diagrams appearing in "Official Diagrams of the Postal Telegraph-Cable Company's Apparatus and Rules Governing the Construction and Repair of Lines" were made from the company's blueprints and are absolutely correct. This volume, which is published by TELEGRAPH AGE, under official sanction and supervision, is of especial value to operators and linemen. It will be sent to anyone, postpaid, on receipt of fifty cents. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

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DECEMBER 1, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

Relay Points and Chief Operators.

The position of chief operator in a telegraph office is one attendant with much responsibility. The successful discharge of the duties pertaining thereto call properly for the possession of qualities of mind and the exercise of executive abilities, distinguishing traits in the man of capacity. Hence it is that one holding that office should owe his promotion thereto because of acceptable training and of proved capability.

Relay offices, in telegraph systems, are crucial points, so to speak, for at such places it is that delay or expedition in the transmission of messages is largely controlled. The alert chief operator with a clear conception of the needs of the service, will keep business moving. He will not permit messages to accumulate in his office, but will see to it that their distribution to points of destination will follow promptly their receipt. If this were not done the manager of the smaller office would frequently be placed in a false position for which he would in no way be responsible, although blame would inevitably and naturally fall on his shoulders. For the minor office man solicits business with the guarantee of its prompt transmission. If this fails because of dereliction at the point of relay he is likely to be called to account by an irate customer. So the importance of early attention to the relaying of messages becomes at once apparent.

Now, there are chief operators and chief operators. In contradistinction to those who conscientiously expedite all relay matter coming to their offices, there are those who carelessly allow messages to accumulate on the hooks for periods anywhere from five to thirty minutes' duration, frequently longer. This is a great mistake and should not be tolerated under normal conditions. It is an act of injustice alike to the sender of the message, the office in which the message originated, and the company which is responsible for its transmission, for which, as a rule, no valid excuse can be given. It should be possible under ordinary circumstances to send a telegram a distance of from 1,000 to 4,000 miles anywhere in this country, and receive an answer to the same within one or two hours' time. If, however, the message be delayed variously from five to thirty minutes at each repeating point, as the case may be, the sending customer may consider himself fortunate indeed if he receives a reply to his telegram the same day. To delay messages as is sometimes done, at repeating stations, simply because the chief is of a temperament to procrastinate, an act which of itself is to encourage like negligent habits in others, is all wrong, and tends to bring opprobrium upon the telegraph company, really undeserved, but for which it is held accountable.

Henniker Heaton and His Two-cent Cable Rate.

Mr. Henniker Heaton, M.P., is at it again, and has succeeded in attracting considerable personal attention to himself as an exponent of cheap telegraphy as exemplified in a lowering of cable tolls. His fad now is a two-cent cable rate to all parts of the British Empire, as well as Government ownership of the cables. His recommendations, however, have a broader scope for their ultimate attainment, for he would include the world in their application. Like prototypes who periodically appear on this side of the Atlantic to criticise and take a whack at the telegraphs, the problems of which involved in management and technicalities in working, perplexing in themselves to trained executives and men of profound scientific attainment, they know absolutely nothing, so Mr. Heaton assumes to speak with authority regarding great systems of ocean telegraphy regarding which his utterances betray lamentable ignorance. His assertions, thrown out with the vague lightness of "I tell you so," are

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marked by superficiality of thought, of erroneous statement and meaningless platitudes, unsupported by evidence, by facts or by figures. In the vernacular of the day, "He makes us tired!" A mind so omniscient as his must seemingly soon develop into omnipotence.

While here in the United States the question of Government ownership does not appeal to the popular judgment, it is different abroad, for State ownership of the land line telegraphs has gained ascendency almost the world over. Despite this fact, it does not anywhere yet appear that the British Postmaster General and the telegraph authorities generally in Great Britain are favorably lending a listening ear to Mr. Heaton's startling proposition. The magnitude of the transaction and the enormous cost involved in acquiring the various lines of British cables, may well cause the Government to stand aghast at the very suggestion.

Mr. Heaton fails to realize that if the Government assumed control of the cables the purchasing cost of the lines, gigantic as that would be, would pale into insignificance when compared with the annual deficit that would result from Government management and the absurdly low rate of two cents a word.

Emphasis may be placed upon the conservative estimate that during the current year over $3,000,000 has been expended on repairs and the maintenance of cable repair steamers. Another fact of importance to be kept well in view is that off the west coast of Ireland over $500,000 is the sum paid for repairing broken cables during the past summer alone. Do such heavy figures of actual cash expenditures warrant the marking down of rates? Such as these and all other burdens of maintenance, under Government control, would fall upon the taxpayer who seldom or never uses the cable, as is also the case with the land line systems, for it is not the public at large who support the telegraph, but the demands of the press and of business men. It is true that important social and death messages find occasional transmission, but comparatively speaking these are but few in number. Over ninety per cent. of the telegrams sent and received in almost every telegraph office in the world relate to business transactions.

Neither Henniker Heaton, nor, indeed, any statesman or advocate has yet been able by conclusive argument to prove the justice of imposing upon the people at large a burdensome tax to meet telegraphic deficit. It makes no difference how low telegraph tolls may be, experience demonstrates that the public generally will not use the telegraph unless the occasion demands speedy action. It is no doubt true that a lowering of cable rates would increase to a certain, yet probably limited, extent the volume of business, but the expense of working would not be decreased, and with enlarged traffic would come additional expense. It was tried once. A reduction was made in the Atlantic rate. The results showed an increase in traffic of about ten per cent. and a falling off in receipts of over forty per cent., not an attractive conclusion surely. It is hardly necessary to say that the rates went up again.

Neither the land line telegraphs or the submarine cables will ever, in our judgment, rob the post office, as we understand its uses, of its legitimate functions.

Mr. Heaton is not happy in his allusions to the working of fast sending instruments by which as he alleges practically unnumbered words may be transmitted over the cables within short periods of time. Here again is the evidence of the catch-penny argument advanced in behalf of lower rates, of which we are not without illustration at home. Messages cannot be transmitted in unlimited volume in unlimited time, for reasons that every well-informed telegraph engineer knows, and if they could, business does not exist that would supply such voluminous sending.

Mr. Heaton alludes to the laying of the Government-owned cable connecting Canada and Australia, as a shining example of such ownership. The enormous annual deficit occasioned by this line, a cause of hearty grumbling to the several colonies that it is supposed to aid, when the hand of the taxpayer in each has to go deep down in the pocket to meet losses incessant in their appeal, cannot be regarded as a flattering exhibit of business acumen to the average man of capital. If a reduction of tolls were now to follow on this unfortunate line, well might hands be thrown up in despair.

Our Canadian neighbors cannot exactly be congratulated over the fact that their Postmaster General, Sir Rudolf Lemieux, who was present when Mr. Heaton read his paper, speaking in reply practically endorsed the visionary scheme to which he had been a listener. The Canadians as a people, like ourselves, are on record as being antagonistic to this idea of abnormally low telegraph rates. They would make their lines of telegraph paying undertakings rather than to be bolstered up by calls upon the Government exchequer.

An Appreciative and Aspirant Telegrapher.

The following letter speaks eloquently for itself. It is commended for its manly earnestness, its evident sincerity, and appears to be an expression coming direct from the heart. It rings true, its note is at concert pitch, and we hope that the communication may receive a wide reading. The writer has revealed his character, unconsciously, perhaps, and we counsel him to continue as he has evidently begun—to study, to be observant, to work hard, to be patient, to be steadfast to his birthright, to the honor and to the manhood that is within him:

I have been prompted to write to Telegraph Age because of what I read in its November 1 issue. Pardon me if I speak too freely of myself. I do not wish to appear unseemly, but there is something in the tone of your paper that encourages me to recip-

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rocate the friendly feeling that marks its attitude toward the operating fraternity. I have heard your friendliness disputed, but I take no stock in such adverse criticism. I feel that it is not warranted.

I am a young operator trying to do my best. Sometimes, I am free to confess, I grow rather despondent when I consider my condition, look upon my environment, and think of the uncertainties of the future. Such moods are foolish, I know. Maybe it is because we are human that they come to one. Then I reason with myself not to be a fool, and pluck up courage, fling myself into my work, and resolve to succeed. But the question is, Shall I? I have many responsibilities to meet, for there has been a shadow in my life; I think of my school days when I was strong with resolve. Thank God, I obtained a fairly good education. I am glad I was studious when opportunity afforded. I hoped for college but that was denied me. The choice of the telegraph business was accidental, but I like it, and shall try to "work out my salvation" in its service, thankful for the helpfulness of Telegraph Age, which I read religiously. Somehow its counsel seems to stir the best there is in me.

But I started in to speak of the excellent letters printed in the last number, written by well-known members in the telegraph service, who urge the necessity of work, work, work and study on the part of operators anxious for promotion. You may smile when I tell you that I have looked up the personal history of these writers in Telegraphers of To-Day, and from other authorities, and that I have found abundant record of who and what they are—in the beginning operators like myself, perhaps working under discouragement. Of course this was not necessary, for the advice they give will stand by itself, but all the same I was interested in doing so, and then the reading was instructive. I notice so much of indifference about me that I sometimes wonder if I, too, shall fall into such habits of common thought and careless methods that shall make me apathetic as to my future. Perhaps such forebodings are due to moments of weariness. But let me tell you, the perusal of the letters has aroused afresh earnest reflection. I for one have been stimulated by them. I notice that each writer followed the same general line of thought, the argument in each case being substantially alike. That is an evidence of the fundamental truth conveyed. What is said shows beyond all controversy that the road to future success is open only to those who will devote time and energies to doing things to the best of their ability, and to keep on doing so. No doubt we must earn what we receive, as you so frequently remind us; there seems to be no getting around that. I thank the authors for their letters and Telegraph Age for publishing them.

The Proceedings of Reunion of the Military Telegraphers.

The proceedings of the twenty-seventh annual reunion of the Society of the United States Military Telegraph Corps, held at Niagara Falls, N. Y., September 16, 17, 18, 1908, has made its appearance. It a handsome brochure of thirty pages, well printed on exceptionally fine paper, and is a fitting supplement to the meeting itself, the doings of which it affords a verbatim report. The output is a credit to its compiler, David Homer Bates, the secretary of the society.

Topics of the Telegraph.

A peculiar form of recreation among the small boys of Connecticut is that of "firing" stones. Whether this kind of sport originated primarily because of the stony nature of the soil of the Nutmeg State, thus in a measure directing this form of childish amusement, is not known, although this custom has prevailed since the early days. Possibly it is a heritage of puritanical times, an era which frequently developed a hard and flinty way of doing things. Be that as it may, it must be admitted that the practice is a most reprehensible one, regarded by sensible people from whatever point of view; especially, it may be remarked with emphasis, when stone throwing is directed against telegraph insulators as the objective point, and particularly so when dexterity of aim and high momentive force have abundantly developed by practice. Naturally the telegraph people have objected, seriously so, and with rising choler, to thus having the fragile portion of their pole line property made a target of, and it is not to be wondered at that they have viewed with dismay, if not with alarm, the wanton and destructive bombardment as it has proceeded. The determination is to mete out punishment to the aforesaid small boy. The difficulty has been to locate him, for his actions have been guerilla-like and elusive. The hand is ready to smite, but the urchin of the environment wears the smile of innocence. Accordingly the telegraph company has caused printed notices of the offence described to be distributed, in which a reward is offered for the apprehension of the culprits. Verily the tribulations of the telegraph are many!

Who of us does not remember the "piece" of school-day declamation, told in humorous verse, in which a French traveler objected to the payment of a b" for his night's lodging when presented by the landlord in the morning, protesting that it was exorbitant and complaining of the presence of rats and mice which raced up and down across his room all night, and which kept sleep wholly from his eyelids. The landlord in reply "confounds" the rats, and expressing a desire that he might get rid of the rodents, the witty guest suggests a remedy which he claims would be effective, namely, to present the vermin with the bill. Now, it appears, that a Postal messenger boy of Freeport, Ill., has invented an "electric" mouse trap, a new type, something evidently owing its existence to ideas gathered by its inventor from the telegraph, designed to meet and overcome just such experiences as caused the Frenchman's discomfiture. Doubtless landlords are plagued by the presence of rats and mice as of yore, and if this modern trap for which extraordinary virtues are claimed, especially fitting it for use in "hotels and other large establishments," as the announcement reads, the guarantee being that it is a "sure thing," the traveler of the future ought to be able to obtain repose in peace and comfort in an overnight lodgment at any caravansary, go on his way rejoicing, first having paid his reckoning without demur. On the theory that a rule is a poor one that won't work both ways, this trap evidently is to meet a "long felt want."

It is said, "Of the making of books there is no

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end." So it appears to be in the bringing of suits against the telegraph companies—there is no end. A fresh experience is involved in the following: A day laborer was at work on a sky scraper structure, in Illinois, at a point distant from his home. In reply to a letter received from his wife, making inquiries regarding his health (he had previously been ill) he telegraphed: "Got your letter. Feel O. K. now." It is claimed that the message on its delivery to the solicitous wife, read: "Got your letter. Fell O. K. now." The wife, we are told, immediately jumped to the conclusion, but whether unadvised or not in the quick mental process, is not stated, that her husband had had a fall. This prompt judgment, so decisive in its findings, left the woman no alternative but to immediately go into a state of decline, because of the mental anguish, as it is called, she had suffered, permanent injury to her health following, thus impairing her powers of money earning. Not only this, but the doctors who were called in to alleviate her distress, have further contributed to her woe by charging $200 for their services. Now, it appears the only balm that will ameliorate her condition, soothe her wounded mind and body, is the sum of $15,000, which she demands from the telegraph company and for which she has brought suit. May not the surmise be correct that modern Dodson and Foggs are taking cases for damages on "spec?"

A case of misplaced confidence has occurred at Oswego, New York. It seems that the bees in that lake city are of an especially industrious variety, and their manufacture of honey reaches unusual proportions. Casting about for a suitable place for storage for an excess of this delicious product, a cap box, located on a forty-foot telegraph pole, appeared to offer superior advantages for the purpose, seemingly secure, on account of its height above the street level, from discovery and consequent intrusion and theft, human propensities that exist where honey is concerned, even in Oswego as at other points. Alas, however, for the trusting confidence of these insects! It could hardly be expected of mere bees to know that the stowing away of honey in the receptacle chosen, no matter how innocent the intent, was in violation, if not exactly of the rules of the telegraph company owning the pole, yet at least of the unwritten law, which would hardly permit the placing of honey or other sweets or food stuff in its cap boxes, because of the liability of such presence to interfere with the proper working of the wires. Indeed, it is to this fact that the bees owed their undoing. A lineman of the company, an excellent employe, yet altogether matter-of-fact, a nature without estheticism, who made the discovery a year ago of a similar storage of honey in the same box, suspecting that wire troubles this season originated from the same cause, and examination proving his surmise to be true, ruthlessly despoiled the patient toilers of the result of their hard-earned summer work. A buzz of protest is heard in Oswego.

Of Interest to Ambitious Students of the Telegraph.

It frequently happens that a subscriber to Telegraph Age would like to secure specific information respecting some particular problem in telegraph engineering; or enlightenment perhaps on a given subject, which, however, would be satisfactory to the recipient if the matter were treated more generically. In order to afford all such seekers in the telegraph field for technical knowledge of a character to be of practical aid to them in pursuing the study of their avocation, this journal will welcome all proper inquiries, to which published reply will be made.

"Some Points on Electricity" has long been a familiar standing title on the first reading page of Telegraph Age; it has indicated a department of this paper that in its wide range of subjects discussed, covering every phase of the telegraph and of its practice, has for years exerted an influence highly educational in character. Written testimony as to the value of the information it has supplied to many a struggling and ambitious student of the telegraph, this journal has in abundance. The wish now is to widen this sphere of usefulness so that the advantages offered may be enjoyed by a greater number; to bring the department and for what it stands in closer touch with those who are seeking to achieve success in their chosen occupation. Telegraph Age wants to help all such, to extend a befriending hand in encouragement of studious and thoughtful natures, to the end that the personnel, and resultantly the service itself, may be benefited. For the telegraph has need, and urgently so, of men with technical understanding.

If operators—telegraphers generally, will avail themselves of this proposition of Telegraph Age, so freely tendered, and thus secure the benefits offered, it is believed that the department of "Some Points on Electricity" will develop even a greater degree of interest and helpfulness than has characterized it in the past, because of the added human element that will be injected into it, always a cause of intensifying and giving force to any purpose or principle.

All inquiries will be replied to either in the form of question and answer, or the matter regarding which information is solicited, if its importance warrants, will be made the subject of a general article.

Communications should be addressed to the Electrical Department, Telegraph Age.

Traveling Man—"My good man, what time does this train leave Swamp Centre?"

Agent—"My friend, I'm only the agent. I'm not a fortune teller."

Orders, if sent to Telegraph Age, Book Department, for any book required on telegraphy, wireless telegraphy, telephony, electrical subjects, or for any cable code books, will be filled on the day of receipt.

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Annual Meeting of the Telegraphers' Mutual Benefit Association.

The forty-second annual meeting of the Telegraphers' Mutual Benefit Association was held in the Western Union Building, 195 Broadway, New York, on November 18, Belvidere Brooks, president, in the chair.

Frank E. Coyle, of New York, was elected secretary of the meeting. After the committee on proxies had reported Mr. Brooks directed that the secretary read the president's report. This was as follows:

The annual reports of the secretary and the treasurer, about to be presented to you, will show in detail the general condition and continued prosperity of your association. The business depression and the unrest which prevailed during the early part of the past year are reflected in the secretary's report by the large number of lapses which for the first time equaled the number of new entrants. The lapses and deaths being in excess of the entrants resulted in a slight loss of membership.

It is gratifying to state, however, that the assets of the association, which show a substantial increase year by year, now amount to $307,059.36, exceeding six per cent. of the total contingent liabilities, and from examination of reports of various state insurance departments I find that this amount is larger in proportion to liabilities than is held by many similar organizations, and, in my opinion, insures the perpetuity of the Telegraphers' Mutual Benefit Association.

In January last the association was examined by the New York State Insurance Department and the net amount of the assets in excess of all liabilities was shown on the examiner's report as filed with the superintendent at Albany, N. Y., to be $247,994.67, notwithstanding that the securities were valued at the very low market prices then prevailing, the report not including the amounts due from members for assessments, while every death claim reported was included in the liabilities, together with the amount of $5,521.73 set aside under the law as a reserve fund. The examination also included an appraisal by the department of the value of every piece of property on which a mortgage is held; the total market value amounting to $188,450, against which the association held mortgages aggregating $78,050.

The report of the examination should be highly satisfactory, as it shows that even under the extraordinary conditions prevailing at the time it was made, and the severe test to which the fund was subjected, the reserve fund has been carefully and conservatively invested and the association found to be in sound financial condition.

We were also called upon during the year to furnish a large volume of statistics for use of the Department of Commerce at Washington, D. C., which included a list of every claim paid since the association was founded.

As a striking instance of the interest in the beneficent work by many of our old friends and members, I am pleased to state that under date of October 9, last, we were advised by the executors of the estate of Emma A. Tillotson, deceased, widow of the late Luther G. Tillotson, formerly superintendent of telegraph of the Erie Railroad, and later head of the large electrical supply house of L. G. Tillotson and Company, Dey street, New York City, a gentleman widely known and esteemed in telegraph circles, that the association was a legatee under her will for the amount of five thousand dollars. This amount, for which the association is grateful, will, in due course, be added to the reserve fund.

That the merits and advantages of membership in a society like ours, when earnestly presented, are attractive to those who love home and family, may best be evidenced by the fact that under conditions as at present existing our Omaha agent recently forwarded twenty-eight applications for membership. Several other agents have also effectively though not so largely contributed, and I sincerely trust that the remaining agents, as well as every member, will be stimulated by these examples to do their full duty and invite every known eligible person to membership in this association, whose sole purpose is the protection of the families of telegraph and telephone employes by the best and safest and most economical plan of life insurance. I congratulate the members on the excellent condition of the association, and I thank the officers and executive committee, the agents and all who have aided me in the work of the past year.

The reports of the secretary, the treasurer and the auditing committee were also read, all of which were ordered printed and distributed among the members.

The secretary's report shows that the total membership is 4,598 in the full grade, and 709 in the half grade.

The sum of $20,000 was carried to the reserve fund, which now amounts to $295,246.43, to which will be added, when received, $5,000 lately bequeathed to the association by Mrs. Emma A. Tillotson. The assets of the association were shown to be of an amount equivalent to a reserve of six per cent. on the total amount of insurance carried by the association.

The amount received for interest during the past year on investments of the reserve fund and current deposits amount to $14,888.88. The income derived from interest is nearly treble the amount of the annual expenses, and is equivalent to nearly three assessments on the entire membership.

The following were elected officers for the ensuing year: President, Belvidere Brooks, of New York; first vice-president, Charles P. Bruch, New York; second vice-president, S. S. Garwood, Philadelphia; secretary, M. J. O'Leary, New York; treasurer, A. R. Brewer, New York. The members of the executive committee consist of President Brooks, W. C. Hunstone, A. R. Brewer, James Merrihew, Charles P. Bruch, T. A. McCammon, G. H. Fearons, E. J. Nally and M. J. O'Leary, all of New York; W. J. Lloyd, of Chicago; auditing committee, H. D. Reynolds, chairman, Buffalo; W. J. Dealy, and Thomas E. Fleming, New York.

Charles P. Bruch spoke in eulogy of the late William H. Young, of Washington, who held the office of vice-president continuously for twenty years. Remarks of a similar nature were also made by W. L. Ives. Resolutions paying tribute to the sterling worth of Mr. Young as a man and as an officer of the association were ordered spread on the minutes of the meeting and a copy transmitted to his family.

Among those in attendance at the meeting were: Colonel R. C. Clowry, E. J. Nally, E. M. Mulford, E. B. Pillsbury, C. P. Bruch, W. J. Dealy, Belvidere Brooks, J. B. Van Every, M. M. Davis, M. W. Hamblin, C. E. Rafford, L. Dresdner, Frank O'Ryan, J. W. English, J. F. Nathan, H. T. Marks, W. L. Ives, C. H. Murphy, R. G. Page, W. H. Jackson, H. W. Drake, H. C. Lock-

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wood, W J. Austin, C. M. Holmes, H. V. Shelley, G. W. Logan, R. J. Murphy, F. J. Scherrer, A. M. Guest, J. B. Taltavall, T. E. Fleming, J. Costelloe, M. J. O'Leary, Frank E. Coyle, all of New York; C. E. Bagley, Pittsburg; S. S. Garwood, Philadelphia; H. D. Reynolds, Buffalo; P. J. Farrell, Boston; S. B. Curtis, Hartford, Conn.; N. R. Young, Washington; W. J. Lloyd and Frank Richardson, Chicago; Ashby Watkins and C. T. Sydnor, Richmond, Va.; W. P. Cline, Wilmington, N. C.; E. J. Kerwin, Albany, N. Y.; W. W. Prescott, Milford, Del.; F. C. Hackett, Toledo, O.; A. M. Smith, Paterson, N. J.; C. F. H. Johnson, Jersey City, N. J.

Dinner of the Magnetic Club.

There have been many noted dinners held by the Magnetic Club in the twenty years of its existence, of which the event of Wednesday evening, November 18, at the Hotel St. Denis, celebrated that anniversary, but of them all the peculiarly delightful social atmosphere that characterized the last meeting has never been excelled. Somehow it seemed a kind of homecoming,and all who met on the occasion appeared to do so because they belonged to the family and accepted their places that were theirs of right. But it was a big family that got together, for one hundred and twenty-five of its members were present. And it was a notable gathering, too, that one observed seated about the tables. Familiar faces were there, representative men of the telegraph, commercial and railroad, the latter in the person of the railway telegraph superintendents. Then commercial telegraph executives of both companies were there, meeting fraternally with those still at the key, for the Magnetic is democratic in spirit, placing all on a social level. The literati of the telegraph, writers and authors on the subject, were on hand, sufficiently so to impart a certain scholarly air to the environment. Out of town delegates to the annual meeting of the Telegraphers' Mutual Benefit Association were also present in considerable numbers as guests of the club; and these, together with a sprinkling of telephone men and representatives of allied manufacturing interests, altogether made up as congenial and pleasant a company as has assembled at a Magnetic Club dinner in late years.

Dinner was announced at half-past six o'clock. When at length the well-ordered menu had been exhausted, coffee served, and cigars lighted, men settled back in their chairs with that comfortable and hard to be defined satisfied feeling that follows a good dinner partaken of under particularly agreeable conditions, waiting expectantly for a further continuation of the programme, referred to as the "flow of soul." Marsden R. Cockey, first vice-president, who presided in place of President George H. Usher, now a resident of Atlanta, Ga., and unavoidably absent, rapped for order, and requested Charles P. Bruch to serve as chairman during the remainder of the evening. He said that as Mr. Bruch was the first president of the club twenty years before, it was eminently fitting that on this anniversary occasion he should again occupy the chair. Mr. Bruch was warmly welcomed as he accepted the courtesy tendered. In a speech largely reminiscent in character, he said in part:

I thank you for the compliment that you have paid me in asking me to preside to-night. It gives me very great pleasure to again preside over a meeting of this club after a lapse of nearly eighteen years.

Our meeting here to-night is for two purposes—one is to celebrate the twentieth anniversary of the Magnetic Club, the other to extend hospitality to the officers and delegates of the Telegraphers' Mutual Benefit Association, and to honor that organization as a whole.

It may not be inappropriate on this occasion to recall the circumstances under which the Magnetic Club was born. In the winter of 1887-1888 the executive committee of the Telegraphers' Aid Society decided to have a reunion of members and a dinner in connection with the annual meeting of that society, and a committee, of which I was a member, was appointed to make the necessary arrangements. The date selected, as I remember it, was about March 15, 1888, but the big blizzard of March 12 of that year made it impossible either for the members of the Aid Society to attend the dinner or for the restaurant to supply it, and the dinner was, therefore, called off.

At a subsequent meeting of the committee of arrangements, however, somebody suggested that the committee at least might have a dinner by themselves, and that each member of the committee should invite one or two friends. A room was engaged for the evening of April 4, 1888, at the Knickerbocker Cottage, at Sixth avenue and Twenty-eighth street. The result was a party of about thirty. I do not recall the names of all who were present, but I remember that among the number were T. C. Martin, Minor M. Davis, Gardner Irving, Wm. H. Baker, J. B. Taltavall, J. M. Moffatt, E. T. Barberie, Alonzo Beatty, R. G. Stephenson, Tom O'Reilly, Charles L. Chase, J. H. Montgomery, D. W. McAneeny, D. B. Mitchell, W. L. Ives, T. A. Brooks, John Brant, E. F. Howell, Hugh A. Moody, Lant S. Jones, Geo. W. Walcott, W. G. Magowan, and myself.

For some reason that I did not know then and do not now know, I was elected to preside over the dinner. No programme of entertainment had been arranged. Everything was left to the chairman. In order that there might be no partiality, every man present was called upon either to make a speech, tell a story or sing a song, and every man did one of those things—some of them did all three. Just before it was time to break up, some one suggested that it would be a good idea to have such dinners periodically, and pursuant to this, a committee was appointed to draft a constitution and by-laws and call for a meeting for organization. The meeting for organization was held on April 19, 1888, and the duties of temporary chairman were again imposed upon me, Mr. George F. Fagan being appointed to act as temporary secretary. The constitution and by-laws were adopted and fifty-one names were signed to the list of charter members. At an adjourned meeting, held a week later, on April 26, officers and members of a governing committee were elected; William J. Dealy, Gardner Irving, William L. Ives and Lant S. Jones were elected vice-presidents; George F. Fagan, secretary, and John Brant, treasurer. The governing committee was: J. B. Taltavall, D. W. McAneeny, J. M. Moffatt and Wm. H. Baker, to serve for two years; E. F. Howell, E. F. Cummings, Conrad Meyer and T. A. Brooks, to serve for one year, and I was elected president. Among the charter members, in addition to the officers and members of the governing committee, were:

F. W. Baldwin, Geo. W. Logan, M. J. O'Leary, W. B. Waycott, S. A. Coleman, T. B. Fullon, J. L. Edwards, F. D. Murphy, T. J. Smith, W. H. Jackson, T. P. Scully, W. J. Johnston, T. M. Brennan and Harry A. Du Souchet.

Time does not permit me to go into a detailed history of the club. From the beginning it was remarkably suc-

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cessful. Its constitution declares that "Its purpose shall be to cultivate social intercourse among its members." This is all that the club has ever attempted to do. I think no one will question the fact that it always has and is now accomplishing its purpose. It has never been ambitious. Its dinners have been simple and sometimes even frugal. It has not tried to educate its members or to discuss social problems or to make a business of distinguishing itself by entertaining distinguished people, though it has incidentally had as its guests of honor a good many men who may fairly be put in that class; but it has always held steadfastly to its original purpose, and I think it is just for that reason that it has been so successful and has endeared itself to all who have participated in its meetings.

Like some of its members, it is growing old—twenty years is old age for a club like this—but it doesn't feel old; it retains the spirit of youth, and I venture to hope that it may go on for another twenty years in its good work of promoting friendships and maintaining good cheer.

After referring at length to the Telegraphers' Mutual Benefit Association, which had its origin in 1867, briefly sketching its history, touching upon its growth, its development, and alluding to those who were instrumental in effecting its organization, the men who have successfully guided its affairs, Mr. Bruch concluded as follows:

The Magnetic Club honors itself in honoring the Telegraphers' Mutual Benefit Association. Indeed, in doing this, it is simply obeying the fifth commandment: "Honor thy father and thy mother that thy days may be long upon the land which the Lord thy God giveth thee," because the Magnetic Club, like all organizations in the telegraph service, is the offspring of the Telegraphers' Mutual Benefit Association. On behalf of the Magnetic Club I express the hope and expectation that the Telegraphers' Mutual Benefit Association may live as long as the telegraph itself shall survive, steadily and rapidly increasing its power for good.

Mr. Belvidere Brooks, president of the Telegraphers' Mutual Benefit Association, in responding therefor, expressed thanks on its and his own behalf, for the fine tribute paid the association by the chairman in his remarks. Mr. Brooks dwelt upon the amount of good the organization had accomplished, stating that no one, unacquainted with the detail, could realize the splendid work, quickly undertaken, that had been performed under its auspices. The organization was, he said, the leading one of the kind in the United States.

Mr. Brooks was followed by William J. Dealy, who spoke in response to the toast of the "Past Presidents of the Magnetic Club." He said:

The Magnetic Club with what may be called its horseshoe emblem for good luck, and its "73" for good will, celebrates to-night its twentieth anniversary. Its members and friends are congratulating one another, and well they may. In the review of its history, some recall one feature, and some another, and yet, in a way, we all drift over the entire field of the magnetic force, and influence. It has been assigned to me to respond for the "Past Presidents." Nobly, as the record shows, has each of them responded for himself. Could anyone other than Charles P. Bruch, the dean, have more beautifully pictured or described the first meeting, with all that it was to bring to us. He did not, however, tell us of his incessant interest in the welfare of the club during all these twenty years, nor that to him more than to any other one member, is due the magnificent success manifested by the brilliancy of this assemblage.

Following such a leader, the present speaker found a smooth and pleasant pathway, wherein there came together the telegraph messenger and the telegraph president, and ere he yielded the gavel, the club had changed the date of the fall meeting to November. Later, and in due course, although not in consecutive order, two others occupied the chair. They shared with us the cheer and the glow of their own bright genial souls. They also gave boundless fame to the club. Their spirit is still with us, and as in silence we pay a tribute to the memory of Past Presidents Edward C. Cockey and Richard J. Hutchinson, let us arise; there were none better. Then at other times the emblems were entrusted to William H. Baker—but who would attempt to tell even half of what he did for them! Edward H. Johnson, electrified and trolleyized them; Francis W. Jones, duplexed, quadruplexed and multiplexed them; Colonel Albert B. Chandler, with the perfect poise of his "Magnetic" power, added to them the best that was within him, and gave to each of us individually, a goodly share of that which flows from the fulness of his heart.

No one in a short after-dinner talk, can dwell as he should upon what any of the "Past Presidents" have done, nor perhaps should any of them be given too much credit, for they all had at times, the full support and the hearty co-operation of the entire membership; but they left nothing undone for the good of the club, and they brought to these meetings guests whom nations have been proud to honor; guests foremost in science, in art, in invention; guests of prominence and achievement in the world's enterprises; and we in being privileged to meet those guests, and to hear them in their after-dinner speeches, have been favored and delighted and instructed, and in every way by means of the club, we have been made better, and broader, and brighter, and happier, so that realizing what has been done, and knowing what can be done, there is no doubt of the continued success which we all wish for our own twenty-year-old Magnetic Club.

A telegram of regret at his absence was read from George H. Usher, Atlanta, Ga., the president of the club. On motion, Theodore L. Cuyler, Jr., was instructed to send a message in reply on behalf of the club expressive of the respect and affection entertained for Mr. Usher by the members, and of the disappointment felt because of his inability to be present.

Letters of regret were read from W. H. Baker, F. W. Jones, W. C. Humstone and James Merrihew, of New York, and from W. J. Lloyd, of Chicago.

Mr. S. S. Garwood, of Philadelphia, was the next speaker of the evening, responding to the toast "Our Visitors," in which catagory he himself being included, he handled his subject with becoming interest and pathos.

The speech-making was brought to a close with a brief address by Colonel A. B. Chandler, after which the guests listened to a programme of music and song.

Each person present wore a decoration of a pale blue pasteboard tag bearing on one side the inscription "20th Anniversary, Magnetic Club; November 18, 1908," while on the reverse appeared the legend, "73, I'm glad I came; Shake."

Among those present were:

Albany, N. Y.—E. J. Kerwin, C. C. King and W. M. Pruyn.

Baltimore, Md.—E. W. Day and Charles Selden.

Boston, Mass.—P. J. Farrell, F. M. Ferrin, A. L. Edgecombe, T. D. Lockwood and C. A. Richardson.

Buffalo, N. Y.—H. D. Reynolds.

New York,—C. C. Adams, S. F. Austin, W. J.

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Austin, J. B. Bertholf, B. Brooks, C. P. Bruch, E. B. Bruch, W. C. Burton, E. S. Butterfield, J. J. Cardona, Col. A. B. Chandler, J. F. Cleverdon, J. J. Cochrane, M. R. Cockey, J. Costelloe, Theodore L. Cuyler, Jr., M. M. Davis, J. A. Davidson, W. J. Dealy, T. L. Donovan, John Doran, B. M. Downs, A. P. Eckert, J. W. English, G. W. Fleming, T. E. Fleming, J. H. Flood, L. B. Foley, W. D. Francis, J. J. Ghegan, E. G. Greaves, S. B. Haig, W. S. Hallett, J. L. Halley, Dr. L. R. Hallock, G. A. Hamilton, T. F. Harvey, Wallace M. Hassell, T. E. Heffen, G. W. Hickey, P. A. Hickey, F. J. Howlett, J. W. Howorth, A. S. Hunter, Chas. Jacobson, E. H. Johnson, G. Johnson, A. D. Jones, James Kempster, F. G. Kernan, F. J. Kernan, E. Kimmey, G. H. Kitt, C. A. Lane, C. F. Leonard, F. E. McKiernan, A. McNeill, J. F. McNeill, D. F. Mallen, H. T. Marks, R. J. Marrin, Wm. Marshall, W. H. Mathews, C. B. Mears, M. de Mendousa, A. L. Miller, Col. Wm. A. Murray, Benjamin Nachmann, E. J. Nally, J. T. Needham, W. F. Newell, F. F. Norton, M. J. O'Leary, R. F. Parkinson, E. B. Pillsbury, R. W. Pope, G. F. Porter, A. E. Price, M. W. Ravens, E. Reynolds, John Riley, W. Scarborough, H. Scrivens, H. L. Shippy, Charles Shirley, J. F. Shugrue, T. G. Singleton, J. F. Skirrow, S. T. Skirrow, J. Smith, F. L. Sommer, T. J. Sullivan, J. B. Taltavall, Col. B. B. Thurston, E. P. Tully, J. B. Van Every, W. B. Vansize, Hugo Weise, Chas. Wessells, J. J. Whalen and Henry Zweifel.

Philadelphia.—S. S. Garwood and L. Lemon.

Pittsburg.—C. E. Bagley.

Portland, Ore.—J. F. Shorey.

Richmond, Va.—C. T. Sydnor and A. Watkins.

Toledo, O.—F. C. Hackett.

Tonopah, Nev.—M. L. McDonnell and F. G. Waterhouse.

Wilmington, N. C.—W. P. Cline.

Energizing of the Inventive Spirit.

Whatever delay there may be in public recognition and adoption of a patented idea of obvious utility, it were better that its promulgation should be made in advance of the times, rather than to be behind thereof. A laggard person, or event or declaration is always to be deplored.

We frequently hear of the inventor whose admittedly useful device, having for its object the welfare of mankind, referred to depreciatingly as being "fifty years ahead of his time," as the saying goes. If the genius who devises were more often of practical mind, could be brought to understand, and to act upon that understanding, that, as a rule, educatory influences must follow in order to make his concreted ideas commercially valuable, success in his endeavor might the more readily be attained.

The building of the Canadian Pacific Railroad across the open prairie, through dense woods and over mountain tops, was in advance of the times. Wise heads with keen vision while hoping for success, discerning that the road would furnish the means of carrying population into the wilderness, which in turn would create abundant and paying business for the undertaking, worked diligently to accomplish that purpose. Yet there were Canadians a-plenty who criticized that great construction, declaring that the road was many years in advance of all requirements. Was it? The price of its stock to-day is eloquent in the answer it makes.

It was declared by the skeptical, the non-progressive element, whose conservative spirit, like poverty, we have always with us, that the electric telegraph invented by Professor Morse, and the telephone, given to the world by Alexander Graham Bell, were but toys, ill-defined fancies of possible somethings that at best were years ahead of their time. The inventors, however, were men of fine mould, who had abundant faith in what they had produced and lost no time in pressing their patented convictions before the world. No one needs to be told that the methods involved therein of transmitting intelligence and speech have revolutionized older systems previously maintained. The inventors were not in advance of the times. The time was ripe for the launching of their projects.

And so it is with most all meritorious inventions. They have been thought out and given to the world in obedience to the spirit of development and progress that marks the evolution and growth of human enlightenment, of higher intelligence and consequently of civilization. The belief must be accepted that they came at the proper time and in proper sequence. Satisfied with and having confidence in what they had produced, inventors who stand out distinctively as world benefactors, have been those who have realized and accepted all confronting difficulties, whether physical or of public opinion, who have overcome objection and ultimately achieved success; the indomitable pioneer spirit, shown conquering even as the valiant frontiersman successfully removes obstacles and prepares the way for future empire.

The Postal Deficit.

The annual report of Postmaster-General Meyer, of the Post Office Department, for the fiscal year, ended June 30, shows a deficit of $16,010,270. The postal receipts were $191,478,663, and the expenditures $208,351,886. While the receipts exceeded those of 1907 by $7,893,658, the annual rate of increase fell from nine per cent., where it has been for the last few years, to 4.29 per cent. This falling off, the Postmaster-General attributes to the financial disturbances of last fall.

It is said he began life as a "poor" telegraph operator; now he is the general manager of the company and is worth a million dollars. The question is, How much would he be worth if he began life as a "good" telegraph operator?

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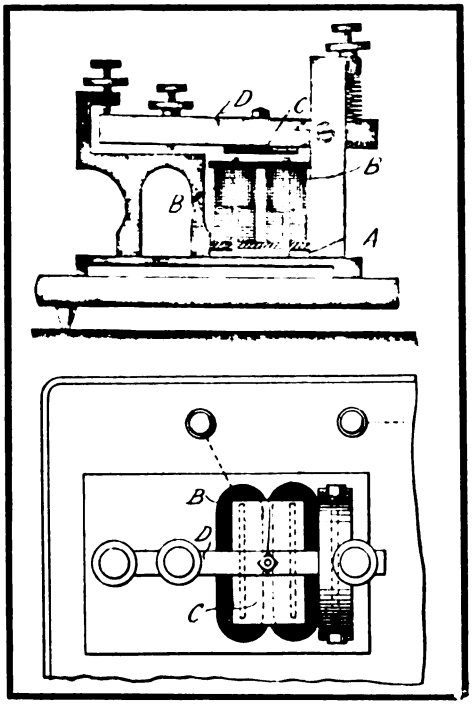
An Improved Telegraph Sounder.

A recent invention illustrated herewith shows an improved form of electro-magnet and armature, particularly adapted for use in telegraph sounders, to increase the sound produced by the apparatus. The sounder is mounted on a metal base supported only at the ends, so that it will act in the capacity of a sounding board. The core of the magnet consists of a flat plate bent to U-shape. Mounted on the two legs of this core are flat spools B, as indicated in the sketch. The armature lever D is provided with a broad armature plate C, adapted to be operated by the electro-magnets in the usual way. By using flat coils instead of the usual round coils, the poles of the magnet can be brought much closer together than usual, providing a much shorter path for the magnetic lines of force through the armature C. In this way a louder sound is produced with the same battery, or if desired, the battery power can



AN IMPROVED TELEGRAPH SOUNDER.

be cut down, for the sounder will make loud and sharp clicks with considerably reduced current. This type of magnet, while particularly designed for use in a sounder, should also be found useful in relays, electric bells, and various other forms of apparatus in which a magnet is employed. The inventor of this magnet is Mr. Lee Kiblinger, of Jackson, La. In writing to Telegraph Age respecting his device, he says in a recent letter that the main object of the invention is to save zinc and copper sulphate either by using one cell of battery on a five-ohm winding, or, by using two cells and have the sounder magnet wound to eight ohms. This, as he says, will be a great saving in battery, even in a few months' use, and would warrant replacing an old sounder by this new one.

The Effect of High-Tension Transmission Lines on Telegraph Working.

The Oregon Electric Railway Company, of Portland, Ore., was recently confronted with the necessity of overcoming the effects of induction from a 33,000-volt transmission line on the operation of an earthed telegraph wire strung on the same pole line, the transmission not being transposed. The Oregon Electric Railway Company handles its trains by telegraph almost exclusively, the only exception being that a telephone circuit is used as an auxiliary. Telephones are fixed in shelter shed stations and in each freight caboose, the latter being equipped with a light pole with terminals, which are hooked over the telephone circuit when it is desired to reach the despatcher from points between stations. The telegraph circuit is fifty miles long, and is supplied with main battery at Portland from one side of a three-wire grounded neutral lighting system in the general office building and thirty gravity cells at Salem. At intervals of about every ten miles a two-microfarad condenser is connected, one side to the line and the other to the ground. According to the superintendent of the Oregon Electric Railway Company, these condensers effectually prevent the induction, and it is possible to work the telegraph through a heavy leak which would put the telephone out of commission entirely.

The life of Lord Kelvin is full of inspiration to the telegrapher, whether of land or cable. The latest volume giving an account of his scientific life, recently off the press, written by Andrew Gray, professor of natural history in the University of Glasgow, Scotland, a former pupil of and assistant to Lord Kelvin, and therefore well equipped for his task, affords a most attractive gift for a Christmas remembrance. For it presents a point of view of that noted scientist, concentrated within the limits stated, of a nature such as to render it valuable to the many who were accustomed to look up to Lord Kelvin as a great leader in the world of science. The activities of Lord Kelvin, even up to the time immediately prior to his death, which occurred on December 16, 1907, were prodigious, and the unfolding and development of his life and character along the lines of scientific thought, study and experiment, leading to discovery unceasingly pursued; the reaching of profound attainments in electrical and other research, including the telegraph, more especially in its application expressed in submarine working, in which connection he invented the mirror galvanometer and the siphon recorder—all may be traced in this delightful volume with pleasure and profit. This book, which is well printed on good paper, contains 316 pages, several illustrations, a number of explanatory drawings, and is fully indexed. It will be sent to any address, carrying charges prepaid, on receipt of price, $1.25, by J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

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Mr. Tinker Furnishes a War Reminiscence.

Mr. Charles A. Tinker in his after-dinner speech on the occasion of the banquet at the reunion of the old-time and military telegraphers at Niagara Falls, recently, referred to his entry into the military telegraph service at the breaking out of the Civil War, and to a letter he had subsequently written to his father while on board the steamboat "Commodore" on the trip from Washington to Fortress Monroe, and thence to the James River, Believing this letter to be of interest, inasmuch as it was a record of events now of historic value, Mr. Tinker has sent a copy of the same to Telegraph Age for publication. By way of preface he says: "I will explain that on March 20, 1862, our Superintendent, Major Thomas T. Eckert, selected a force of eight operators, three from General McClellan's headquarters in Washington; three from the office at Fairfax Seminary; one from Upton's Hill (closed), and still another, eight in all. They were A. Harper Caldwell, Jesse H. Bunnell, John H. Emerick, Charles W. Jaques, Brainard H. Lathrop, Henry L. Smith, Charles Snyder and myself. Owing to various delays the steamer did not sail until April 1.

"The letter referred to is one of the many I wrote home during my service in the United States Military Telegraph Corps, nearly every one of which was carefully preserved by my father and returned to me shortly before his death many years after. They form a most interesting and detailed record of my experiences, and to me now are of priceless value.

"The envelope in which the letter was enclosed has a print in colors of "Old Glory" flying over a mounted cannon, and under it the words: 'The Old Flag—We will protect it and avenge its insults.' The picture occupied so much space that I had to write the address diagonally, and in explanation added: 'The old flag is in my way, but I would not pluck a star to remove it.'"

"On board Steamer 'Commodore,'
"Off Mattawaman Creek,
"Potomac River, April 1, 1862,
"9 o'clock P. M.

"At last the head of the long talked of (in these parts, for I think it has been kept too secret to be heralded north) expedition is on its way down the Potomac. Being one of its component parts, and knowing that you at home will look anxiously for a line from me by first mail, consistent with delays in transportation from the seat of war, I have secured a convenient place at a side table amidst the hubbub of social enjoyments in the cabin, among officers of all grades and 'stripes,' from generals down to corporals of the guard, and will drop you a few lines of my evening's recollections of the past twelve or fifteen hours, hoping you will excuse a pencil sketch, for without it you would get nothing at all, as ink is among the absent conveniences found on board this steamer.

"I telegraphed you at noon yesterday that 'I sail to-day.' So I did. At three o'clock I took a hack from the War Department, which brought another operator and myself, with a cook. (By the way, Mr. Eckert has taken to himself 'Beverly,' the cook, who served me so faithfully at Upton Hill all winter, and he is now with us and will be our servant and cook during the summer's campaign.) As I was saying, the hack took us, bag and baggage, to the Seventh Street wharf, where we changed to the ferry for Alexandria, arriving there at six P. M. Came on board the 'Commodore' expecting to start at once for Fortress Monroe, but soon learned that 9 A. M. to-day was the hour appointed for sailing. Deposited our luggage in a comfortable stateroom. The telegraph office! You will laugh at the idea of a telegraph office on board a steamboat. Nevertheless there has been one on this boat for the last two weeks, where General McClellan has had his headquarters. I was shown to a berth, where I deposited myself for the night and enjoyed a good night's rest. Got up to breakfast at 6 o'clock this morning. It was a soldier's fare, bread and coffee and a little meat. At 9 o'clock steam was up and everything in a stir and bustle, indicating an early start, but General McClellan was not yet on board and everyone looked anxiously for his coming, knowing that until he came we must linger in expectation.

"Here I will tell you of our steamer. She is the large Sound steamer built for, and formerly running on, the Fall River Line between New York and Fall River. She is splendidly finished and considered a sea-going and staunch craft. There are on board three or four hundred officers, clerks, guards, etc., in government service, with a hundred or more servants. The boat is loaded with all sorts of war materials; horses, wagons, baggage of all kinds, and innumerable articles which no one could describe. General McClellan and staff are the most prominent of the military dignitaries. Now sitting where I can cast my eye around and see them all as they are enjoying themselves at cards, dominos, backgammon, chess and checkers, and chatting and smoking are Generals McClellan, Barnard, Williams, Barry; Colonels Hardie, Ingalls, William B. Astor, Duke De Paris, Count De Chartres, Prince De Joinville and many others I might name, less noted officers of the great Union army. Our party comprises Mr. Eckert, the superintendent, and eight operators, including myself and Beverly, the cook. We are bound for Fortress Monroe, there to accompany General McClellan's army through its southern campaign to conquer the enemy. We have laid in a stock and supplies to keep up comfortable for the next six months. I hope before that time has passed we may be released from our chosen bondage, to return to and enjoy the society of our friends left so far behind.

"Returning to my narative: We passed the hours from 9 to 11 A. M. in discussing the prospects and expectations of our contemplated life and experiences with the army in the South, etc. At 11 A. M. President Lincoln and Secretary Seward visited the steamer and inspected her 'from stem

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to stern,' and I am sure if their pleasing countenances were telltale pictures of their feelings they had not a fault to find with her appearance, nor a hope lost in her worthiness to undertake the task of conveying the head of the army and its headquarters also from Washington to Fortress Monroe. At 12, noon, we dined. At 3.15 P. M. McClellan arrived from Washington and came on board. Of course, he was welcomed by many cheers and joyful demonstrations. At 3.15 P. M. the telegraph wires were cut away, the bow and stern lines drawn in and we floated out into the stream with the steamer's bow pointed for 'Dixie.'

"The sail down the river was most delightful. For a long time Washington, the Capitol, Alexandria and Georgetown were in full view and their domes glistened in the bright rays of the southern sun. We passed Fort Washington shortly before sundown. Bands were playing and soldiers cheering and waving their caps and flags, wishing us 'Godspeed' on our journey of deliverance to those in bondage, friend or foe. A half hour later we passed Mount Vernon, the most sacred spot of earth on the American continent, where are entombed the remains of our good old father Washington, 'first in war, first in peace and first in the hearts of his countrymen!' Had he lived in 'sixty-one' I would never have sailed on a mission of war which now carries me almost beneath the shade of the weeping willow which marks the sacred ground in which he lies. 'Tis a solemn moment which finds the traveler nearing this enchanted spot, for the common and binding rule among steamboat men on the river is to stop the engine, to toll the bell and dip the ensign, as they float by. A few miles below we came to the first rebel battery (no vacated) which has been such a terror to shipping on the Potomac. Two miles below it we came to anchor where we now are, still and peaceful as at home. General McClellan has gone (out on a gunboat which came alongside) for a reconnoissance up the creek, and we are to lay here until morning. As soon as he returns we will be up and moving once again. We all like the idea of lying still to-night and getting a good night's sleep and to-morrow have a daylight view of the rest of the river and of Chesapeake Bay, which we pass through on our way down.

"I will finish and mail this letter at Fortress Monroe.

"April 3, noon. Off Fortress Monroe.

"We started at daylight from Mattawaman Creek yesterday and came leisurely down the river, entering Chesapeake Bay about 10 A. M. A gentle breeze was blowing, giving a slight ripple to the water, just enough to sway our great craft to and fro as she plowed her way through the 'briny deep.' We came in sight of the vast fleet of ships, in the midst of which we are now anchored, about 4 P. M., and then our speed slackened and we steamed down till dark, when we came to anchor where we now lie, midway between the Fortress and Sewall's Point, where the rebels have a battery of nine guns. The morning is warm and bright, not a breath of air stirring. I would call it midsummer weather. I have stolen away into the captain's office, the key of which I have been the possesor since we started, as it contains all our valuables, instruments, stationery and other telegraphic supplies, of which I have charge, until they are distributed for use. I find no pens or ink or writing paper here, so I have 'confiscated' a few blanks (as my own paper is exhausted) and will finish this letter, now fearing I may not have another opportunity.

"I wish you could get one look of the beautiful prospect presented to view from the deck of this steamer. 'Tis magnificent, and I cannot disguise a degree of pride and satisfaction which charms me as I think of the many advantages I have for witnessing with my own eyes the wonders of the age, about which all christendom is at this moment aroused. Ships (perhaps three or four hundred) of all nations and climes are now within view. The 'Rinaldo,' famed for its part in the Mason-Slidell affair, is just to our stern, with her English ensign flying and all sails set as if in defiance. Two French men-of-war lay but a short distance to the leeward with their tri-colors flapping and steam up, as ready to take a hand in any game that may chance to invite them. The little Monitor, that pride of American chivalry and monument to Yankee genius, lies hardly a stone's throw on our larboard bow. You would laugh could you see her. The rebels call her a 'cheese-box,' but they found the 'mites' she contributed to their mess all they could digest. She is being visited by many a skiff load of officers from our steamer. We are all looking anxiously for the 'Merrimac,' which is expected out from Norfolk hourly, and we hope to witness another great fight and glorious defeat of the rebel ingenuity. The 'Monitor,' the 'Minnesota' and the 'Vanderbilt' and many smaller gunboats are ready to receive her when she shall appear. We are going right to work with our telegraph lines and hurry them along where most needed. We have brought five miles of cable to put a splice in the one now laid between here and Cape Charles, and if successful we hope to be in communication with Washington direct next week.

"The tug has come alongside to take us ashore, bag and baggage. We go right into camp between Hampton and Newport News.

"I must finish now."

Apropos of the sporadic borrowing of Telegraph Age by non-subscribers, noted in so many offices, a friend of this paper writing to us on the subject of subscriptions, rather sententiously remarks: "Operators, as you doubtless know, are frequently a difficult 'bunch' to handle, but it surprises me when managers, chief operators and others do not take the paper. I should like to make a quiet little bet that those self same people take a surreptitious peep at Telegraph Age just about twice a month."

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The Storage Battery and Its Rapid Development in Railroad Service.

The principle of the storage battery was discovered in 1801 by Gautherot, who experimented with platinum electrodes immersed in a salt solution, according to the statement made in the committee report of the Railway Signal Association. Practically nothing was done to develop the principle until 1860, when Gaston Plante, a Frenchman, experimented with a cell consisting of lead strips immersed in dilute sulphuric acid. He discovered that each time the cell was charged and discharged, the amount of current given out on discharge was greater; and further still, that by charging the cell in reverse direction each alternate time, the capacity was rapidly increased. He amplified this process and was able to construct plates having sufficient capacity to make them a commercial possibility. Most of the changes and improvements of the storage battery since this time have been along these lines. Hence Plante is justly considered the inventor of the storage battery.

Plante's method of charge and discharge in reverse direction caused an increased deposit of active material on the plates due to peroxidizing of the raw lead, thus resulting in an increase in capacity. This method of forming active material from the raw lead was slow and difficult and led to the experiments of Camille A. Faure, who, in 1881, patented a process of making storage batteries by covering the lead surface with lead oxide paste instead of forming the lead electrochemically as in the Plante process. One charge only was then required to put the plates in condition to produce their final capacity. In the United States, Charles F. Brush developed simultaneously with Faure the same process, so that in this country Brush is considered the inventor and his patents here controlled the process.

All lead storage batteries are to-day produced by one or both of these processes, so that they are of the Plante type, the Faure, or a combination of both types, in which case one plate, usually the positive, is Plante, and the other Faure. Storage battery practice of to-day has therefore evolved through continuous mechanical and chemical improvements from the plates originally made by Plante and Faure.

The commercial use of storage batteries in this country on a large scale began about the year 1893. From this time on, storage batteries came into greater use, the most noticeable applications at first being in connection with isolated electric plants, Edison lighting systems and electric street railways.

In 1896 the Edison Electric Illuminating Company, of Boston, installed a battery of 8,000 amperes. This was the first big step in the use of storage batteries on an extremely large scale. Since then most of the larger Edison plants throughout the country have installed enormous batteries so that, at the present date, there are one hundred and sixty-five such plants operating, aggregating 215,000 kilowatt hours. The use of large batteries in isolated plants and street railway plants has developed simultaneously, so that there are now in operation 1,100, aggregating 316,000 kilowatt hours.

The most prominent installation of batteries to date is that of the New York Central and Hudson River Railroad, which is now operating or installing 2,692 cells in nine batteries, aggregating ing 60,000 horsepower hours at the regulating rate in connection with the electrification of the steam road in New York City and vicinity.

The extensive use of storage batteries in connection with signal work on steam roads is practically confined to the past ten years. In 1898 storage cells were installed on the Pennsylvania west of Pittsburg, these cells charging from gravity cells and discharging upon the signal circuits. It is a matter of interest to note that many of these original cells are still in service.

In 1902 the Pennsylvania installed at Paoli a complete storage battery system and charging plant. The cells were located in the semaphore bases and charged from a circuit running from a centrally located plant over a wire running to each end of the division. The installation probably represents the first large installation of this character.

Both of these systems involve the use of batteries permanently located at operating points—the current for charging being brought to the batteries. This method seems to be almost universal on the eastern roads. In the west, however, not only is this method operated, but also portable storage batteries are used on a large scale, the batteries being removed at fixed intervals, to the central charging plant, recharged and returned to the operating points.

In 1900 the Southern Pacific used storage batteries of the portable type in connection with automatics. At this time a Plante type portable battery was used. This battery was of considerable weight, but was the standard at that time. There are now in service about 60,000 cells of portable batteries for signal work, used principally on western railroads.

The use of storage batteries for signal work gained very little importance for several years after their initial use. It was in 1903 that they came into general use, and since that time have increased at the rate of approximately one hundred per cent. per year, up to 1907, when little increase was made.

In 1899 storage batteries of 3,000 watt hours were installed; in 1900, 60,000 watt hours. Following this the years are as follows: 1901, 90,000 watt hours; 1902, 150,000 watt hours; 1903, 625,000 watt hours; 1904, 1,150,000 watt hours; 1905, 2,300,000 watt hours; 1906, 4,700,000 watt hours; 1907, 5,000,000 watt hours.

Telegraph Age has helped many a telegrapher in his career. It will help you. Price, $2 a year. Send for a free sample copy.

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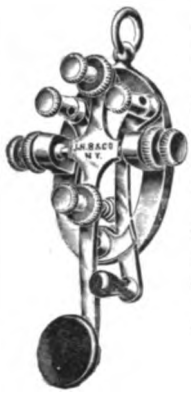

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The Railroad.

The twenty-fifth anniversary of the adoption of standard time by the railroads in this country, was reached on November 18.

The Lackawanna Railroad has just completed its new station at Scranton, Pa., which is one of the finest and best arranged in this country. The telegraph office is conveniently situated and is equipped with modern telegraph machinery, everything in the office being of the most approved pattern.

Recent tests on the Freeport division of the Illinois Central Railroad of telephone train despatching have been successful. Eight offices of the division were recently equipped as a result of the satisfactory operation of the system, and it is believed that, within a few months, a complete telephone system will be installed.

At the fall meeting of the American Railway Association, held at Chicago on November 18, the joint committee on interlocking and block signaling recommended, and the association adopted, a resolution that "In the opinion of the American Railway Association the substitution of the telephone for the telegraph in blocking and despatching trains can be made safely; and the use of the telephone for such purposes is recognized and recommended as a standard operating instrumentality."

J. O. Fagan, a towerman on the Boston and Maine Railroad, read a paper on "Neglect of Employes to Observe Signals and Obey Rules," at the annual meeting of the New York and New England Association of Railway Surgeons, in New York, on November 17. Mr. Fagan deprecated the theory often set forth that overwork of railroad employes was responsible for accidents, remarking: "After practical investigation I am obliged to arrive at the conclusion that, taking everything into consideration, the railroad man working at high and long pressure actually makes fewer mistakes than the man who works at normal and long pressure or on a loaf. From my point of view the engineer, brakeman or telegraph operator who is busy all the time is as a general rule more reliable than the man who is busy intermittently."

The Eastern Committee of the Association of Railway Telegraph Superintendents met in New York on November 19, Charles Selden, of Baltimore, chairman. While a number of matters were handled in executive session pertaining to questions of detail upon the various roads, the subject of train despatching by telephone was evidently the one thought that dominated the meeting. A number of reports were read from the various railroads, giving the results of their experience with train movement by telephone; also covering the use of the telephone for local railroad message business from the roads that had already supplied themselves with such circuits and with phantom circuits between large points. The results shown were so remarkably good that the following resolution was adopted:

Resolved, That in the judgment of this association, the use of the telephone in the despatching and blocking of trains is just as safe, if not safer, than the telegraph, and in addition thereto has many advantages.

Therefore, we unanimously recommend its use and its further adoption for such purposes.

The committee adjourned and met in the afternoon at the laboratory of Mr. Thomas A. Edison, at West Orange, N. J., where Mr. Edison explained to them the principle of the telephone apparatus to be used on railroads, which will largely augment the sound of conversation and give remarkably clear articulation.

The following persons represented the railroads named: N. E. Smith, New York, New Haven and Hartford; J. B. Fisher, Pennsylvania; S. A. D. Forristall, Boston and Maine; L. B. Foley, Delaware, Lackawanna and Western; E. P. Griffith, Erie; W. P. Cline, Atlantic Coast Line; W. F. Williams, Seaboard Air Line; J. S. Stevens, Chesapeake and Ohio; C. P. Adams, Southern; Charles Selden and E. W. Day, Baltimore and Ohio.

The Western Union Telegraph Company was represented at the meeting by Belvidere Brooks, general eastern superintendent, and E. M. Mulford, district superintendent, of New York, and E. B. Saylor, superintendent, of Pittsburg.

The President and the Sweeper.

When a conductor of a Lackawanna train, says World's Work, walked in from the Hoboken trainshed to make his report at the office, he was stopped by a tall, iron-gray man, who held out his hand with a greeting.

"Good morning, Parsons. How's the rheumatism?"

"Better, sir," said the conductor; "but I guess it will get me again in December. It always does. how are you?"

"Pretty well—and we're keeping the railroad running all right. Glad to see you are cutting down the 'lates' since the signals are working better. Keep it up. And don't forget to take care of yourself—good bye."

As he went on to the ferry, he stopped four times in fifty yards to speak to different men—a starter, a station-sweeper, another conductor, and a man in plain clothes. What he said probably did not amount to much, but it seemed to mean something to the men.

This was W. H. Truesdale, the president of the Lackawanna road. The men to whom he talked were men of the railroad staff, upon whose aggregate performances rests the reputation of the road. How much of its success is due to just this spirit shown by his greetings to his men, no one can say accurately. But it is pleasant to record that a busy president finds time enough in crossing the ferries to exchange the time o'day with station-sweepers, engine wipers, and men of the road.

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The "73" Dinner to Mr. Carnegie.

On Wednesday, November 25, Andrew Carnegie was seventy-three years of age. On the evening of Friday, November 27, at the Hotel Manhattan, New York, he was entertained at a dinner in celebration of the event tendered by telegraphers, those in the service and graduates therefrom. In the note of invitation the affair was referred to as the "Telegraphers' '73' dinner in honor of their comrade, Mr. Andrew Carnegie." The occasion was a notable one inasmuch as it was a spontaneous expression of the respect and genuine affection for the distinguished guest which pervades all ranks of the telegraph. More especially, perhaps, is this noticed among military telegraphers who were contemporary with Mr. Carnegie, and in whom and between whom the true spirit of comradeship abounds, because of the fact that at the opening of the Civil War so many began their army service under him, for he was founder of the military telegraphs. Hence the title by which he is affectionately known, "Father of the United States Military Telegraph Corps."

Dinner was served at seven o'clock, the handsome apartment in which the guests were assembled being brilliantly lighted and tastefully decorated with flags, flowers, etc. Over the head table, which was placed crosswise at one end of the room, blazed the electrically lighted symbol "73." Seated at this table was Colonel Robert C. Clowry, who presided and who acted as toastmaster. At his right sat Mr. Carnegie, while at his left was Thomas A. Edison. Others at the table beyond Mr. Carnegie were: W. C. Brown, George B. Harvey, U. N. Bethell, George G. Ward, Charles C. Adams and William S. Hawk; in the line beyond Mr. Edison were: William R. Plum, Edward J. Nally, John B. Van Every, E. W. McKenna, C. H. Ackert, George W. E. Atkins and Thomas N. Miller.

Placed about the room were circular tables, each affording accommodation for eight persons. At the first table at the left front of the guests' table were seated the members of the committee of arrangements, each wearing white rosettes, to whose indefatigable efforts the success of the affair was due. These were: David Homer Bates, chairman; William J. Dealy, secretary; Belvidere Brooks, Charles P. Bruch, Colonel Albert B. Chandler, Charles A. Tinker, William Bender Wilson and James Merrihew.

The remaining tables held each its quota of guests, the assemblage altogether presenting a highly representative telegraphic gathering, included among them being numerous railroad officials of high executive position. Each military telegrapher present wore pinned to the lapel of his coat a neat little decoration in the form of a tie made up from two tiny American flags. Placed beside each plate were printed lists of the names of all those present, and to each guest was presented as a souvenir of the occasion, a miniature telegraph sounder bearing the legend engraved on a metal plate fastened to the under side: "Telegraphers' Dinner, in honor of Andrew Carnegie, Hotel Manhattan, New York, November 27, 1908."

The menu pages, eight in number, and which contained the order of exercises, together with appropriate reference to the occasion and to the telegraph, bore on the front page an engraving showing the birthplace of Andrew Carnegie at Dunfermline, Scotland. Other engravings showed a portrait of Benjamin Franklin, and of Professor Morse, the inventor of the telegraph; a view of the first telegraph machine; the workshop of Morse and Vail, at Speedwell, N. J., where their early experiments were carried on in 1837, etc.

After the entry of the guests to the banquetting room, and while standing about the tables prior to being seated, the entire company united in singing "America," immediately following which a flashlight picture of the scene was taken.

The musical feature of the evening was the singing of Miss Leila Livingston Morse, a granddaughter of Professor S. F. B. Morse. She has a fine mezzo-soprano voice which was heard to great advantage, the sweetness and purity of her tones and excellence of execution arousing much enthusiasm. She has a charming presence and was the object of much social attention, as it was natural under the circumstances that she should receive.

At the conclusion of the dinner Colonel Clowry, the toastmaster, rising in his place, said:

We are here to-night to welcome a distinguished guest and comrade, Mr. Andrew Carnegie, on his seventy-third birthday, and the appropriate emblem of the occasion is our fraternal greeting "73," which means kind wishes and regards.

Mr. Carnegie began his business career in a telegraph office, and he could not have chosen a better school. The young telegraph operator has constant practice in the primary elements of education; such as reading, writing and arithmetic, and through his routine work is brought in close touch with the thoughts and methods of men of large experience in business affairs. It is estimated that seventy-five per cent. of the leading railroad managers in the United States graduated from telegraph offices, and I know of many men distinguished in other lines of business who handled the telegraph key in their youth. But whether a telegraphic education leads to high business positions or not it certainly leads to higher intelligence and knowledge of human affairs.

These meetings are conducive to good fellowship and recreation, and I always consider it a privilege to attend them and to meet so many old friends. To Mr. Carnegie, our guest of honor, and to every other person here to-night, I say most heartily "73," or, God be with you.

The first speaker of the evening to be introduced was Colonel William R. Plum, who delivered a lengthy and scholarly address. He referred to the wonderful accomplishment of this age of electricity and steam, of a higher and broader advancing civilization, in the later promotion of which Mr. Carnegie, the guest of the evening, had been so forceful, so generous and so manly heroic an agent, paying fine tribute to his character, and

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the intelligent and magnificent use he had made and was making of his vast wealth—"one of Morse's messenger boys rising from the healthful glow of enobling poverty." In concluding Colonel Plum said in part:

Comrade telegraphers, graduate and undergraduate, as our civilization is heavily charged with redeeming energies, so the electric tongue, speaking all languages and ignoring distance, is conveying the thoughts of mankind in all directions by telegraph and cable, telephone and wireless throughout the United States at the rate of 13,431,100,000 communications per annum, of which at least 389,000,000 are telegrams or other long-distance messages or conversations, and the cry is more.

Over six billions of pieces of first-class mail matter, of which seventy-seven millions were foreign, and four and three-quarter billions of printed matter passed through our post offices last year, and the cry is more, more.

About eighteen million miles of wire are in use by telegraph and telephone companies in the United States alone, and over 231,000 miles of cables, largely ocean, contract the world, but the cry is more, more, more. Approximately the same local conditions prevail in other countries. Even China is waking up and has 75,000 miles of telegraph wires. Steamships are multiplying and the wireless locates them as they move in their orbits about the globe.

Half a million miles of railroad furnish land transit for the world's passengers and freight, of which 224,363 are in the United States carrying over 800,000,000 passengers and the cry is more, more, more, more.

Ten billion, three hundred and twenty-five million, one hundred and forty-three thousand, one hundred and eighty-eight newspapers were published in the United States in 1905, of which over seven billion were dailies replete with telegraphic advices, but the demand increases. Other countries vie with us in their own marvelous facilities for interchange of thought and merchandise as well as passenger traffic.

"Time and space," wrote Mr. Carnegie, "are already annihilated by electricity, and steam is rapidly making the world one vast neighborhood." "Day unto day uttereth speech, and night unto night showeth knowledge."

With such a spread of intelligence, the subject is fast becoming a citizen, the citizen a king. Where the people do not now, they will rule. Figure-heads may occupy thrones for a time, dedicate public works and preside over the activities of a nearly useless social aristocracy, but the handwriting is on the wall. Intelligence, and one vast brotherhood of man follow in the wake of electricity and steam. Encouraged by the gospel of wealth, triumphant democracy, made possible by electricity and steam, disseminators of knowledge and the decrees of peace universal, four in hand, will go round the world in the chariot of Morse and Watt, led by Aurora, and spread with garlanded hands the light of the Sermon on the Mount, the fatherhood of God and the brotherhood of man.

Forty-seven years ago, he whom we especially honor to-night, took the initial steps toward the formation of the United States Military Telegraph Corps, which during our Civil War constructed and operated fifteen thousand miles of telegraphs, one thousand of which were field lines, transmitted six million telegrams, many in cipher, and recorded the history of the war as that of none other had ever been done. History affords no parallel of so powerful a foe operating along so great a front being finally overcome.

Surrounded by the deadly waters of the Peninsula and Yazoo, amid the whistling bullets and shrieking shells, in lonesome and unguarded places, with cavalry deep in the enemy's country, with infantry in the rifle pits and advanced parallels, yea even in the front of actual battle and at all important headquarters, the brave operator, faithful as the electric current itself, served his country uncomplainingly. The student of military history will find cause to doubt the possibility of Union success unaided by the telegraph corps. I do not hesitate to affirm that without such a courier successful co-operation would have been impossible. No other arm of the service was ever so confided in and none other ever dismissed by a civilized government with such lack of manifest gratitude. Even now the richest government on earth leaves it to the "Father of the Corps" to pension his needy children in their old age.

Glory and honor and long life to the great soul that was not appalled even in assuming the obligation of eighty-odd million of people.

Remarks of David Homer Bates:

In all probability I am the only person present this evening who learned the art of telegraphy in the superintendent's office at old Outer Depot, Pittsburg, which was burned by the rioters in 1877 in our country's first great railroad strike. Mr. Carnegie had just been appointed superintendent of the Pittsburg division of the Pennsylvania Railroad. This was in 1859, only ten years after his entry into the telegraphic service as a messenger. My friends, there are very few links in the chain of telegraphic history. Let me mention three of them: First, Benjamin Franklin was born two hundred years ago in the little town in Massachusetts named after King Charles. Always of an inquiring turn of mind, in 1752 he flew his kite into the empyrean to prove that heaven's mighty lightning flash and man's puny electric spark were one; second, Joseph Henry in 1832, at Albany, demonstrated that the earth's natural magnetism was identical with that produced by the passage of an electric current through a wire around an iron helix; third, in 1790, one year after Franklin's death, Samuel F. B. Morse was born in Charlestown, within a stone's throw of Franklin's birthplace. In 1837 Morse joined the two links which Franklin and Henry had forged to a third link in the marvelous chain. At that time our honored guest was an infant in his mother's arms. Morse and Vail carried on their experiments in the humble workshop in Speedwell, New Jersey, which is pictured on the back of our menu card.

Out of these conceptions grew the mighty giant of the telegraph whose Briarean arms now encircle the globe. The name—Speedwell—carries with it a prophecy of fulfillment of Puck's promise to Oberon: "I'll put a girdle round about the earth in forty minutes."

In our telegraphic code the signal "13" means, "Do you understand?" When Andrew Carnegie was thirteen years of age, he, like Franklin before him, wanted to understand all about things electric, and so he became a telegraph messenger and was soon afterwards an operator. That, my friends, as he recently told me, was the turning point in his career, for his duties in the telegraph office brought him into close and frequent contact with Thomas A. Scott, that prince of railroad men, with whom he was thereafter associated for twenty years, during which formative period Carnegie laid the firm foundation of his future wealth. Surely there was a tide in his affairs which, taken at the flood, led on to fortune.

One supplemental link in the telegraph chain may be mentioned, namely, the Military Telegraph Corps, of which Mr. Carnegie was one of the founders, his message from Washington in April, 1861, calling for operators for the army having been answered by nine young men from his line, four of whom are long since dead, namely, David Strouse, our first superintendent; Samuel M. Brown, Albert C. Snyder and William E. Tinney. The other five are expected to answer to their names this evening, namely, Colonel William Bender Wilson, Colonel James Ross Gilmore, Richard O'Brien, Jesse W. Crouse and your speaker. This was the nucleus of the corps. Other operators followed from various sections of the country, until at the maximum our corps numbered 1,500, our average age being under twenty. All have passed away

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but about two hundred, many of whom have reached or gone beyond the psalmist's limit of three score and ten. Out of this small remnant there are with us to-night a few members who, with some of our sons and grandsons, may be distinguished by the red, white and blue colors of "Old Glory," worn with pride upon our breasts.

Although we helped to save our country in the Civil War, which ended over forty-three years ago, we have not yet been given a pensionable status in the United States Army, of which in fact we formed a component part. We asked Congress for bread and received a piece of paper, having been awarded a certificate of honorable service in 1897, thirty-two years after the Civil War's close. One of these certificates stands in the name of Andrew Carnegie, who, no doubt, prizes it as highly as, perhaps more highly than, any of the finely engrossed encomiums from the innumerable recipients of his world wide bounty.

Until Congress shall recognize the justice of our claims and pass the measure so long slumbering in the House committee room, Andrew Carnegie has taken the place of the government and, commencing January 1, 1908, he has consented to send a private soldier's pension check—$144 per year—to each one of his needy comrades whose application has received the approval of the executive committee of our corps. Up to date the committee has approved sixty-nine applications. The names of these comrades are held sacred in our files and are unknown to each other or even to Mr. Carnegie, except perhaps incidentally.

No one can ever know, it is not possible even to imagine, the vast amount of comfort already secured to these needy and worthy beneficiaries and their dependent families.

All honor to our first Chief, our Benefactor and always our Comrade and Friend!

Colonel William Bender Wilson spoke as follows:

There is a charm to me in looking back upon the days of my telegraphic career and calling to memory the comradeship of those who manipulated the key. The telegraph operator of the fifties and sixties was a force in the community. He was proud of himself, proud of his profession and, in the language of our late comrade, Lew Somers: "There was an esprit de corps which held him up to a high standard, lest he bring dishonor on the good name of the profession, and upon his compeers whose good opinion he valued. There was a bond of brotherhood which required no vows to make it strong. The mystic chord which bound them so closely together in good fellowship perhaps had its birth in the mystic fluid which brings those afar off into close personal touch. Its subtle charm is felt now as it was then, and will ever hold in closest friendship the true brotherhood of telegraphers."

In the year 1852, under appointment of James Douglas Reid, I entered the service of the Atlantic and Ohio Telegraph Company at Harrisburg, Pennsylvania, as messenger. I was proud of the position, as it seemed to be the opportunity I longed for of connecting myself with the thought of the great world which pulsated over the iron threads. In that office I learned to telegraph and soon became an operator, and three years later I was sent by David Brooks to open an office at Wilmore, on the western slope of the declining spur of the Allegheny Mountains. On that Pennsylvania Railroad line there were but four other offices, Altoona, Gallitzin, Johnstown and Outer Depot, Pittsburg. Robert Pitcairn presided at the first and Andrew Carnegie at the last-named office. In addition to being the telegraph operator each was secretary to his superintendent, and both developed as by intuition a mastery of rail transportation. It is but justice to say of those Scotch boys that they were influential factors in preparing the foundations for, and building thereon, that splendid system of transportation which lifts with ease the traffic of a continent over a mountain whose summit is 2,200 feet above the level of the sea. The first message I sent from Wilmore was from Colonel Bopp, the agent, to Superintendent Scott, at Outer Depot, and I yet hear the clear Morse of the acknowledgement signals, i. i. o. k.—A. C. That was my first contact with Mr. Carnegie, whom I soon learned to love for his sterling character and manly worth, and to-day, as the shades of three score years and ten are enveloping me, I still love, honor and respect him for those qualities, the intervening years having only strengthened my original feelings toward him.

In retrospective view of my life at Wilmore there looms into prominence two figures, Thomas A. Scott, the superintendent of the western division of the Pennsylvania Railroad, and Andrew Carnegie, his right-hand man. The former was then thirty-one years old and the latter twenty. Mr. Scott, who became the most brilliant railroad manager of his day—a man I loved in life and whose memory I revere—was then but fairly entering upon his famous career, and was most fortunate in having Mr. Carnegie for his confidential aide. They seemed to possess many characteristics in common, both possessed untiring energy, boundless resources, quick decision and strong nerve; both were ever ready to assume great responsibilities and carry them to a successful issue. It was a splendid and unmatched combination, each being necessary to the other to complete the successful whole in the production of positive results. Mr. Carnegie's subsequent career is well known, as is the fact that his success in life is due to his native ability and forceful character. It is to those qualities that the credit is due for the great work he has done toward the advancement of man. His desire, to see a universal brotherhood of man, living in peace together, is not an emotion of yesterday nor to-day; it was inborn in him of a parentage to be proud of and if he had not a dollar in the world he would strain every faculty to gratify that desire. The man in him would have proclaimed itself under any and all circumstances, and had he never seen a steel mill, his star would shine with the same if not greater brilliancy as the most notable philosopher and the greatest apostle of peace and good will in the world to-day.

We are here to-night to celebrate the seventy-third anniversary of his birth, and to commemorate the fact that in early life he was a telegraph operator. With that in view, I desire to say to him: (Here Colonel Wilson addressed Mr. Carnegie.)

Emperors, kings and savants of the world have greeted you; captains of industry, trade and finance have bowed before you; statesmen and scholars have consulted you, and the poor have called you blessed, but nowhere have you been so thoroughly understood and highly appreciated as in the family of the telegraph, and as I say I love you wholly and solely because you are Andrew Carnegie, I but breathe the sentiment that animates the hearts of all the fellows of your early craft, who surround this board. As we lay this loving tribute on your heart we utter the wish that you may have many more years of a useful and happy life.

William J. Dealy said:

It may be that there is nothing new under the sun. Thales, 2,500 years ago, found that friction applied to amber, for which the Greek word is "Elektron," developed both an attractive and a repellent force. But through all the years since, up to within about "seventy-three," nothing in electricity or in anything else, compares with the progress made in the lifetime of those whom we affectionately class as the "Forty-niners" of the telegraph, and of whom, several are with us here to-night. Well do we all remember the light of other days, and contrasting it with the incandescent, or the arc of to-day, there instantly comes to our minds a picture, telling that everything is new when viewed from the standards and methods, and

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means, and appliances of the long ago. Not only in the light do we see the change, but in the power, and in the energy; and in the inventions and in the activities that cover every field, and that supply every need and that extend, that expand, and that create varied and colossal industries, uniting all mankind as brothers, and making them as partners in interest, in the world's enterprises.

There was very little of what we now understand as commerce prior to the pulsations of the telegraph through the forests, and over the hills, and across the mountains, and under the seas, pulsations that cleared the way to the resources and hidden treasures of every land. No force has ever given such stimulus to development and transportation as that of the wires; no other could make possible the commerce of today, nor could guide and control and lead it, as the telegraph does. But, achievements are "not attained by sudden flight," and so, our "Forty-niners," except perhaps our honored guest, were not in the beginning expert in manipulating the key; its mechanism was somewhat heavy for rapid work, the early conditions generally were not favorable for speed. The paper tape upon which was embossed the long dots, and the longer dashes, leisurely and with a sometimes exasperating regularity rolled from the register, gracefully though often uncomfortably winding itself around them, but with a persistency in study and labor, they forced improvement, and when the tape was abandoned they were charmed with the sound of a fascinating song. Then one by one, the conversational signals which those "Forty-niners" had previously used became unnecessary. But there was one which they retained, and which they and we regard as the fraternal sign of the craft, harmonizing and vibrating with every friendly tradition and chord of the wires.

There are in our language words that are sublime in their meaning, words that are as euphonious as chimes from silvery bells; words that seem to fall as velvet on the cheek; words that flow in ecstacy and delight from the poet's pen; words that picture the happiest scenes of our lives; words glowing with sympathy, comfort, contentment and joy; words that are radiating, responsive and echoing with all that is affectionate and endearing, as well as with all that is inspiring to courage, and hope, and strength. But to a telegrapher they are all combined in the simple numerals, the magic signal, "73." There are no words to fully define it, we can only say of it, that it is expressive of all that impels us in the direction of the brotherhood of man, and although emblazoned on the escutcheons of many, it is only in the deeds of the few, entwined, but pre-eminently and in all its splendor, it is woven in the years of Mr. Andrew Carnegie.

Richard O'Brien, of Scranton, Pa., who was next introduced, said he had never been much given to speech after a very early experience with Mr. Carnegie. That was when Mr. Carnegie was assistant to Mr. Scott, and Mr. O'Brien a night operator along the line of the Pennsylvania Railroad. There was an accident and somebody got the blame—the wrong man Mr. O'Brien thought. So he butted in in defense of the accused and found that he was all wrong. To him Mr. Carnegie had said:

"Richard, if you want to succeed in this business you'll have to keep your mouth shut, and always remember that a close mouth is a sign of a wise head."

Mr. O'Brien then went on to state how Mr. Carnegie called the boys on to Washington who formed the basis of the famous corps and how he had himself been the chief operator at Fort Monroe and in charge of the Union lines in Virginia and North Carolina during a great part of the struggle between the North and the South.

Charles P. Bruch was introduced as the son of Samuel Bruch, who had charge of all the Union telegraph lines in Tennessee and Kentucky. Mr. Bruch spoke on "The Telegraph; Pioneer in Modern Progress." After a graceful reference to the guest of the evening, he said in part:

This is a birthday celebration and it is permissible on such occasions to look backward—to count successes and perhaps to mourn failures. I think, however, that the telegraph has no failures to mourn, notwithstanding what the gentlemen who file claims for errors may have to say.

The telegraph is only sixty-four years old. There are many still living and active who were men grown when Morse gave his invention to the world. Perhaps some of them are present here to-night. The first student of telegraphy on the first telegraph line ever erected, who later was the builder of the first telegraph line into New York City, is still living at ninety-one years of age, and has his home only a few minutes' ride from this spot. I refer to Orrin S. Wood.

The telegraph service is a university. It gives a liberal education. Its pupils gain practical knowledge and training in loyalty, self-reliance, courage and all qualities that make for usefulness, and go out to take their places as efficient workers in every field of endeavor. Hundreds of men who regard the telegraph as their alma mater are foremost in business, science, the learned professions and in public service.

Colonel Albert B. Chandler, who was introduced as the pioneer of the Postal Telegraph-Cable Company, spoke briefly, paying a warm tribute to the manhood qualities, the life and example of Mr. Carnegie.

Mr. Carnegie when introduced and in rising to speak, was greeted with prolonged applause. He said in part:

This is the greatest public honor that has ever been conferred upon me. I don't value so much the tributes of officials who have to say something pleasant by reason of their position. But I can find a note of sincerity in the kind words I have heard to-night, which thrills me when I think that there is no triumph so real as to receive in your mature years, in your old age, the testimonial of those who were the friends of your boyhood—there is no such testimonial as that to be found anywhere in the world. I'd rather take your certificates for my warmheartedness, my sincerity, my earnestness, and my honesty than all the signatures of all the prominent men I can think of. And when it comes time for me to cross the border I'd rather take as my passport your certificate, as my boyhood friends, who have known me from the start, than the certificates of all the priests and bishops I could find by searching from one end of the world to the other. I must say with Hamlet, "I think myself in nothing else so happy as thinking of my dear friends."

Mr. Carnegie told, among other things, how he came to be admitted to membership in the Authors' Club. It was shortly after his first book came out, and when his name was proposed a representative of a publishing house objected on the ground that millionaires couldn't write books, and had secretaries for that purpose. At the next meeting a man from the publishing concern which brought out the volume produced some of the original manuscript in Mr. Carnegie's handwriting. Whereupon a fresh objection was made that

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the Authors' Club was an organization of authors, not millionaires. "Then," said Mr. Carnegie, "some one commented that while I might be a very rich man, I was a mighty poor author, and I was elected."

Mr. Carnegie paid a tribute to Thomas A. Edison, whom he said sits by himself among inventors. He also referred in pleasant vein to Colonel Robert C. Clowry, W. C. Brown, C. H. Ackert, E. W. McKenna, as well as calling the names of a number of former Pennsylvania Railroad and telegraph employes, who had been kind to him as a boy.

Before breaking up the following verses, transposed from Auld Lang Syne by Marion H. Kerner and dedicated to Andrew Carnegie on his seventy-third birthday, were sung:

Should auld acquaintance be forget
And never brought to mind,
Should auld acquaintance be forgot
And the days of Auld Lang Syne?
That good old song to mem-ry dear
Shall ever welcome be,
We'll blend its notes fraternally
With cherished Seventy-Three.

For Auld Lang Syne, dear boys.
In tuneful harmon-y,
Breathes Friendship, Love, Good Fellowship,
When joined with Seventy-Three.

God grant our honored guest the peace
His life has fairly won,
And crown him with Thy blessings
For the noble deeds he's done.
'Tis not a nation—but the world
To him should grateful be,
Oh! may he live yet many years,
Sustained by Seventy-Three.

For Auld Lang Syne, dear boys,
In tuneful harmon-y,
Breathes Friendship, Love, Good Fellowship,
When joined with seventy-three.

Among those present were:

Ashtabula, O.—Charles W. Jaques.

Atlanta, Ga.—Jacob Levin.

Baltimore, Md.—Charles Selden.

Boston, Mass.—Stephen E. Barton.

Buffalo, N. Y.—Harvey D. Reynolds.

Chicago.—Theodore P. Cook, Edward W. McKenna, A. H. Bliss.

Lombard, Ill.—Col. William R. Plum.

New Haven, Conn.—Orry M. Shepard.

New York.—Charles C. Adams, George W. E. Atkins, John C. Barclay, David H. Bates, David H. Bates, Jr., James R. Beard, Albert Beck, A. T. Benedict, James Bertram, U. N. Bethell, A. R. Brewer, Belvidere Brooks, W. C. Brown, Charles P. Bruch, Edward B. Bruch, Andrew Carnegie, Albert C. Case, Col. Albert B. Chandler, Albert E. Chandler, Willis D. Chandler, Col. Robert C. Clowry, Theodore L. Cuyler, Jr., Charles H. Davis, Minor M. Davis, William J. Dealy, Charles C. Dickinson, S. S. Dickenson, F. A. Duneka, Thomas A. Edison, Thomas E. Fleming, R. A. Franks, Frank S. Gannon, William Gellatly, John J. Ghegan, George A. Hamilton, Geo. B. Harvey, W. S. Hawk, W. R. Holligan, William Holmes, Edwin F. Howell, Gardner Irving, James Kempster, Marion H. Kerner, Thomas M. King, V. J. Knittle, F. T. Leigh, Daniel B. McCoy, T. Commerford Martin, William Maver, Jr., James Merrihew, Charles E. Merritt, Thomas N. Miller, E. M. Mulford, Edward J. Nally, Michael J. O'Leary, C. F. Patterson, Edward B. Pillsbury, Ralph W. Pope, Henry A. Reed, J. C. Reilly, Edward Reynolds, H. E. Roberts, William D. Sargent, Ashton G. Saylor, Franklin J. Scherrer, Capt. W. A. Sheldon, John A. Sleicher, V. C. Stanley, Joseph W. Stover, John B. Taltavall, A. L. Tinker, Charles A. Tinker, Charles Trippe, John B. Van Every, John R. Van Wormer, George G. Ward, M. T. Wilbur and William H. Woolverton.

Philadelphia, Pa.—Jesse W. Crouse, George W. Snyder, and Col. William B. Wilson.

Pittsburg, Pa.—George A. Cellar, N. E. Church and Elgin B. Saylor.

Rome, N. Y.—Albert W. Orton.

Scranton, Pa.—Thomas E. Clarke, Dr. John E. O'Brien and Richard O'Brien.

Titusville, Pa.—Daniel Colestock.

Tonapah, Nev.—F. G. Waterhouse.

Toronto, Ont.—Isaac McMichael.

Washington, D. C.—C. H. Ackert, Major J. Orton Kerbey and Jesse H. Robinson.

Westfield, N. J.—James N. Worl.

There is always a constant demand for books treating on the general subject of electricity from a point of view and in a manner making clear information that the average individual desires to know, but which he frequently finds so difficult to obtain. A volume of this character which is not amateurish in expression, but which, while not designed for experts, is nevertheless valuable to the seeker after knowledge, is prized by those whose opportunities for gaining information on the several branches have been limited. Such a book is "Electricity Made Simple," by Clark Caryl Haskins, the well-known electrical writer. The dedication illustrates the democratic purpose of the author, for it reads, "To my many friends in blouse and overalls, with kindest remembrances." The volume is bound in paper covers, embraces nearly 240 pages, and in its twenty-one chapters, and 108 illustrations, touches upon and illuminates a variety of topics such as are seldom so comprehensively assembled in a single volume. When it is considered that the cost of the book is but fifty cents it will be seen that this low price puts it within the reach of everyone. It will be sent postage paid on receipt of price. Address J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

The testimony of progressive operators is that TELEGRAPH AGE is so thoroughly comprehensive in character as to make it absolutely indispensable to those who would keep informed. Its technical articles are of high practical value. Write for a free sample copy.

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LETTERS FROM OUR AGENTS.

PHILADELPHIA, POSTAL.

Miss Ella Cadwalader has been appointed stenographer to Manager J. A. McNichol, vice B. H. Moore, who has resigned to enter other business. For the past nineteen years Mr. Moore has held the positions of chief clerk in the superintendent's and manager's office. He also was manager of the Baltimore office for a period of four years during this time.

On account of failing health Mr. H. Thompson was compelled to relinquish his position as traffic chief. Mr. M. N. Redding, night wire chief, has been appointed in his stead. Mr. M. A. Baker, who has been away on account of ill-health, has returned much improved and has received the appointment of night wire chief.

Operator Charles W. Williams has returned to his home in Niles, Mich., on account of failing health.

Messrs. Price, Beasley, Ray, Mason, Nunneville and Auerbach, who went to Princeton to send the reports of the Yale-Princeton football game, deserve commendation for the splendid work they did under adverse weather conditions. They worked faithfully out of doors during the sleet, snow and cold rain until their work was finished.

TOLEDO, O., WESTERN UNION.

Harry Grime, aged twenty-four years, an operator in the employ of this company, died on November 6.

Mr. E. H. Someroak, an operator in the local Produce Exchange office, left November 10, for Seattle, Wash., where he will in future make his permanent residence.

NEW YORK, WESTERN UNION.

Mr. T. A. McCammon, chief operator, has returned from Canada, whither he was called to attend the funeral of his sister.

Mr. C. W. Hanson, assistant chief of the gallery, who has been ill, is now convalescing at Lakewood, N. J.

The sympathy of the force is extended to D. W. McAneeny, assistant wire chief of the eastern division, whose wife died on Sunday, November 22. The interment was at Utica, N. Y.

Mr. Ralph Dacosta, for many years a member of the all night force, died on Saturday, November 21, from blood poisoning. Mr. Dacosta had been ill but a few days, and his sudden death was a great shock to his many friends.

The mother of C. A. Meyer, chief of the eastern division, died on November 7, at the venerable age of ninety years. Her funeral was attended by a number from this office.

Misses Edith Thomas and Irma Jones, operators in the main office at New Haven, Conn., were among those from out of town who attended the Aid Society reception recently. Subsequently they were visitors at this office, where they have numerous friends.

Another recent visitor was Miss Helen Haydock, of the Minneapolis, Minn., office.

NEW YORK, POSTAL.

Among the recent arrivals are C. A. Balsley, former Postal manager at Syracuse, and Miss Grace M. Munn, a former incumbent of this department, and E. W. Applegate, an old-timer and well-known electrician.

Mr. Charles E. Mix, who worked for this company for the last five or six years, has accepted a more lucrative position with one of the railroad companies.

OTHER NEW YORK NEWS.

The reception and entertainment given on the evening of November 10, by the Telegraphers' Aid Society, in behalf of the relief fund maintained by that organization to assist sick and needy telegraphers, not members of any organization, proved to be such a pronounced success, both from a social and financial point of view that Robert J. Marrin, vice-president of the society, and chairman of the entertainment committee, desires publicly to express his personal appreciation of and thanks to those who by their efforts and presence contributed to make the occasion so enjoyable, and happily so successful in the amount of money realized for its worthy object.

Mr. E. W. Griffith, son of E. P. Griffith, superintendent of telegraph of the Erie Railroad, New York, was married on November 17, to Miss Alice Maud Stark, of Passaic, N. J. Mr. and Mrs. Griffith are now making a wedding tour through the Southern States. Mr. Griffith is an attache of the electrical laboratory of the Western Union Telegraph Company, 195 Broadway, New York.

J. J. Kelly, aged thirty-eight years, a former manager of the American District Telegraph Company's office at 8 West Twenty-third street, New York, died on October 14.

Mr. George M. Eitemiller, the well-known old-time telegrapher, who has been identified with the telegraph service at Pittsburg for the past thirty years, has accepted a position with the Interstate Long Distance Telephone Company, at Detroit, Mich.

The Serial Building Loan and Savings Institution will hold its regular December meeting of shareholders at the office of the corporation, 195 Broadway, New York, on Tuesday, December 15, for the purpose of nominating officers and directors, the same to be voted for at the annual meeting of the shareholders to be held at the same place on Tuesday, January 19, 1909. In a ringing circular note incident to the occasion, addressed to the membership, President J. C. Barclay makes a number of very pertinent allusions to the standing, the growth, the opportunities and the future of the institution.

The Electric Building Loan and Savings Institution will hold its regular December meeting of shareholders at the office of the corporation, 253 Broadway, New York, on Friday, December 11, for the purpose of nominating officers and directors, the same to be voted for at the annual meeting of the shareholders to be held at the same place on Friday, January 8, 1909.

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Obituary.

Edward J. Sullivan, aged thirty-seven years, a telegraph operator employed at Milwaukee, Wis., died on November 13.

W. T. Heard, aged fifty-seven years, manager of the Western Union Telegraph Company at Florence, S. C., for the past thirty years, died of consumption on November 16.

Sidney Edward Morse, formerly the editor of the New York Observer, a son of the founder, and a nephew of Professor S. F. B. Morse, the inventor of the telegraph, died in New York, November 14, aged seventy-three years.

Oliver Hart, a member of the firm of Charles Head and Company, bankers and brokers, New York, died November 14, in the forty-second year of his age. He entered the employ of the firm of which afterwards he became a member, as a telegraph operator.

Telegraph Age Borrowers Read This.

Mr. D. L. Graham, of Canal Dover, Ohio, a subscriber of many years' standing of Telegraph Age, evidently has suffered the too common annoyance, complained of by others, of having his copy of the paper borrowed by selfish readers, who will not themselves subscribe for it, for in a recent letter he is moved to say: "If you wish to keep abreast of the times subscribe for Telegraph Age; if you don't have snap enough to subscribe, don't borrow your neighbor's paper." With this declaration off his mind Mr. Graham proceeds to lay down a few level-headed bits of wisdom after this fashion: "No other man can climb the ladder of success in your behalf, work out your own salvation. Some men will argue: 'What's the use paying $2 per year for Telegraph Age when we can send and receive with perfect ease.' God pity the telegrapher if that is all he knows and can do. I have been a telegrapher for seventeen years past, and believe I can send and receive with the best of them. But my aim is to learn something more than this in the broad field of telegraphy. Telegraph Age has been to me an efficient help. Any operator will derive abundant and substantial benefit if he will heed its teachings, and follow closely all that Mr. Jones has to say in every issue under 'Some Points on Electricity.'"

Mr. Otto Holstein, a subscriber of Telegraph Age, located at Cerro de Pasco, Peru, in a recent letter, states that this paper is appreciatde by him in those high altitudes. He says: "Ours is probably the highest telegraph line of any in the entire world; the wires at no place are below an altitude of 12,000 feet and rise from that height up to close to 15,000 feet. Right here at Cerro de Pasco, the elevation is 14,208 feet above the level of the sea. We experience some very interesting natural electrical phenomena and its effect on the telegraph and telephones is remarkable."

Mr. E. B. Pillsbury, general superintendent of the Postal Telegraph-Cable Company, New York, sends us the following letter: "I enclose renewal of my subscription for the twenty-fifth time. Your journal is always a welcome visitor, and I never fail to find interesting and helpful matter in its pages."

The Serial Building Loan and Savings Institution, 195 Broadway, New York, invites correspondence with telegraph operators, city or country, who desire to open a bank account. Organized under the laws of the State of New York, it offers an absolutely safe depository for money, on which five per cent. will be paid. It extends "fraternal" aid in procuring homes under attractive and exceptional conditions.

Advertising will be accepted to appear in this column at the rate of twenty-five cents a line, estimating eight words to the line.

Yuba Consolidated Gold Mining Co., a recently effected consolidation of three contiguous properties in California, well developed, 23 claims, 60 stamps, good equipment, now producing. Dividends soon. I offer 5,000 shares, subject to reservation, at 30 cents; par $1.00. Can recommend. R. Hitchcock, Box 1765, New York City.

Reward: A reward is offered to any person furnishing information as to the whereabouts of Operator E. J. Hamilton. Address "Z," care Telegraph Age.

Will buy or sell, in one to ten-share lots, Western Union Telegraph Company and Mackay Companies, stocks. Remittances by New York draft or express money order are requested. Address "Stock Investment," care Telegraph Age, 253 Broadway, New York.

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No operator who has to use a hard key knob continuously should fail to possess one of these flexible rubber key caps, which fits snugly over the hard rubber key knob, forming an air cushion. This renders the touch smooth and the manipulation of the key much easier. Price, fifteen cents.

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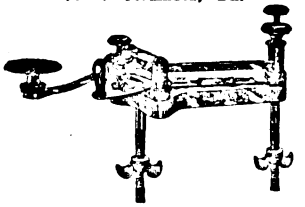

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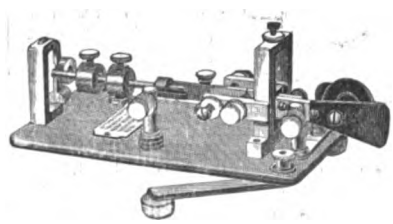

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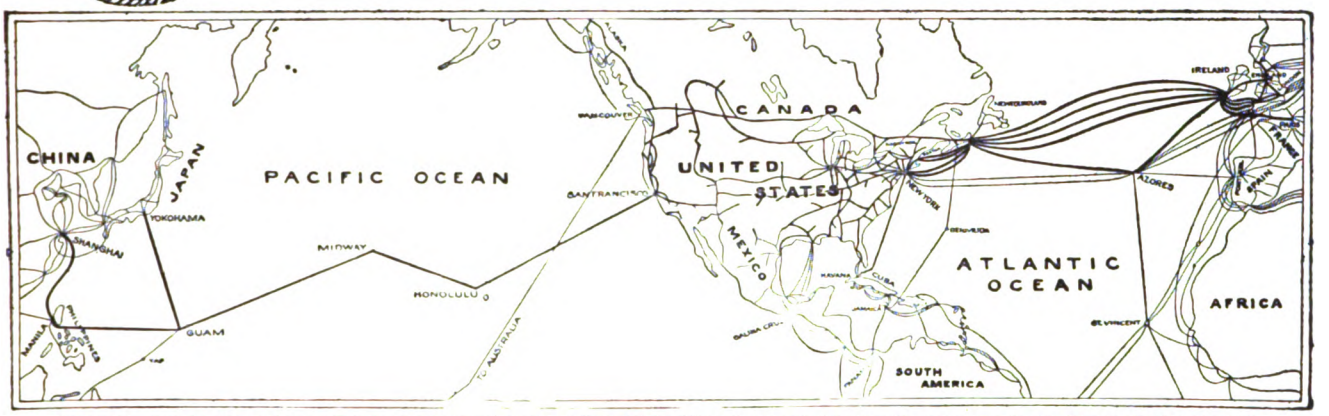

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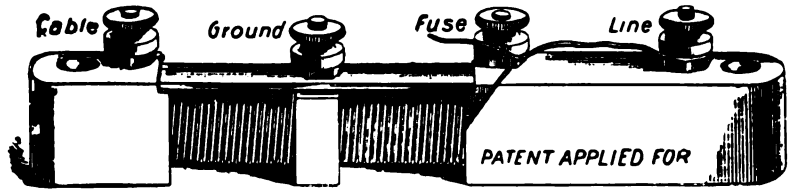

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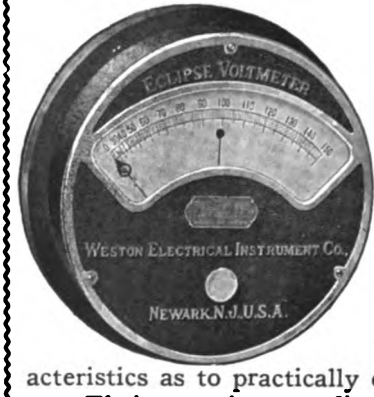

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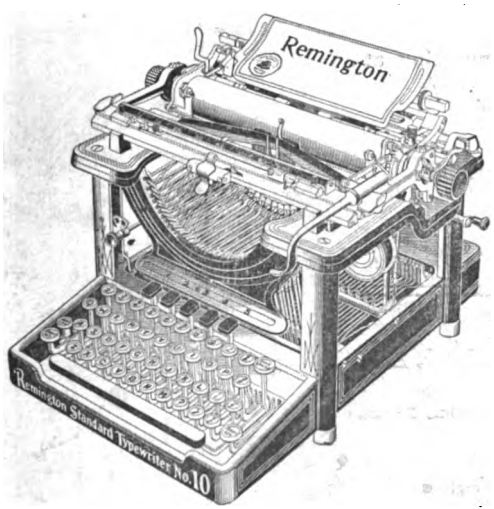

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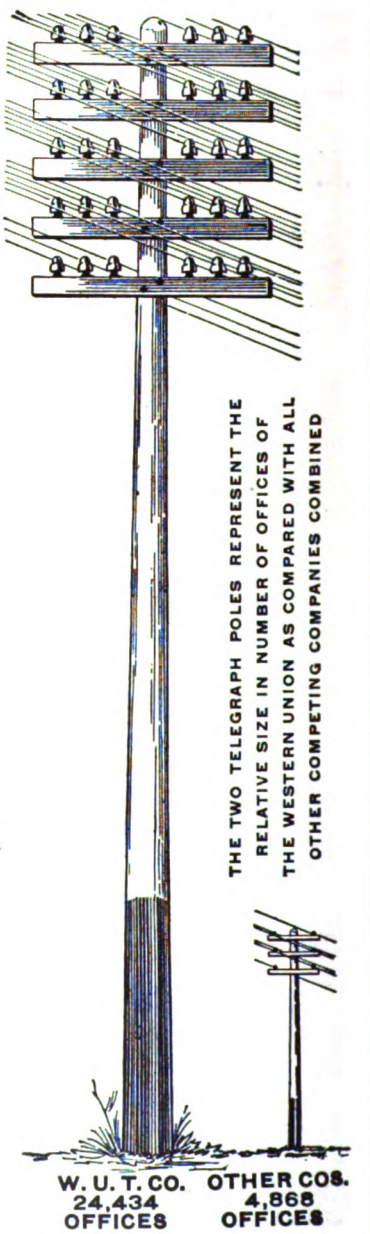

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Association of Railway Telegraph Superintendents meets at Detroit, Mich., June 23, 24, 25, 1909.

Commercial Cable Company meets the first Monday in March, at New York.

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Great North Western Telegraph Company meets the fourth Thursday in September, at Toronto, Ont.

International Association of Municipal Electricians meets at Atlantic City, 1909, at a date to be named later.

Old Time Telegraphers' and Historical Association, will meet at Pittsburg, Pa., at a date to be named later.

Postal Telegraph-Cable Company meets the fourth Tuesday in February, at New York.

Telegraphers' Mutual Benefit Association meets the third Wednesday in November, at New York.

Train Despatchers Association meets in 1909 at Columbus, O., at a date to be determined upon.

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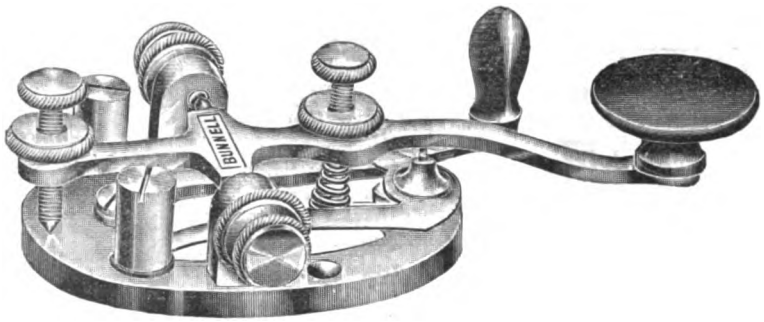

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SOME POINTS ON ELECTRICITY.

BY WILLIS H. JONES.

Elementary Lessons Concerning the Connections and Operation of Repeaters.

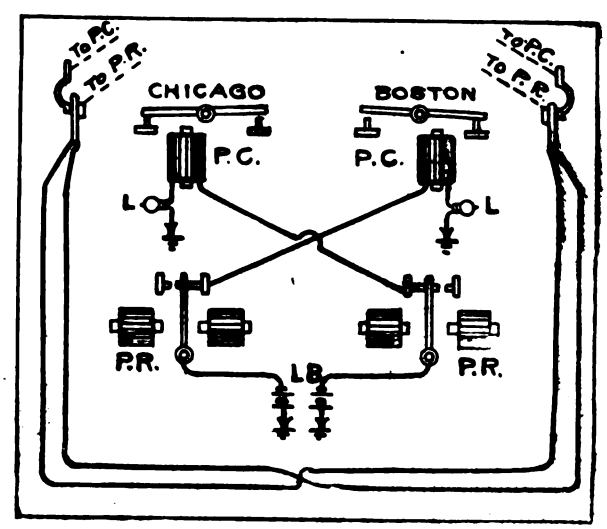
(PART IV.)

One might naturally infer that the connections and arrangement of apparatus necessary to cause one multiplex set to automatically repeat or duplicate its signals in another multiplex circuit must be very complicated. The fact is, however, the arrangement is so simple that the additional apparatus required to connect two multiplex circuits together hardly warrants the dignity of being called a repeater. All the accessories required are two short lengths of wire, as may be seen by a glance at the accompanying diagram, which represents two duplex circuits so connected at a repeating station. The polechanger and the polarized relay on the left we will assume comprise the Chicago set, and the similar apparatus on the right that of Boston.

The student will readily understand that if an operator manipulates the western polechanger in the usual way, that is to say, by means of the key, the operator in Chicago will hear the signals made. Hence any mechanical device that can control the polechanger should be able to perform the same kind of work as that done by hand.

Accordingly the local battery circuit containing the magnet of the Chicago polechanger is extended and connected through the contact points of the Boston relay. The Chicago polechanger and the Boston relay thus hold the same relative position towards each other that an ordinary sounder does to a single line relay, and as the Chicago polechanger now works in unison with the contact points of the Boston relay, it is obvious that the former will repeat to Chicago every signal arriving from Boston. As the Boston polechanger and the Chicago relay are similarly connected signals may be simultaneously transmitted in the opposite direction in the usual manner of duplex operation.

While the connections in the diagram show the manner in which they are usually made where the arrangement is to be permanent, the method



of making them, in our large modern offices, is somewhat different. In other words, the arrangement of the local circuits is such that any two multiplex circuits may be quickly "repeatered" together, or speedily disconnected as the occasion requires whenever there is a temporary or permanent demand for the same. In actual practice the connections are made at the loopswitch, to which board the local connections of all multiplex apparatus are extended and terminate in springjacks.

On the right and the left of the diagram are shown two springjacks which we will assume represent the local connections of the Chicago and the Boston polechangers and relays, respectively, extended to the loopswitch. The outer lip connects with the polechanger, or sending side, and the under lip with the relay, or receiving side of the multiplex apparatus. The connection be-

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tween the two springjacks at the loopswitch is then made by means of a cord (also in the loopswitch) containing two insulated conductors each terminal of which ends in a wedge with two brass blades or faces. When the wedge on one end of this cord is inserted in the springjack connected with the Chicago apparatus, and the companion wedge on the other end of the cord in like manner inserted in the other or Boston springjack, those two multiplex circuits will be joined together in exactly the same manner as they are shown to be in the central portion of the diagram.

The advantage derived from the modern method, of course, lies in furnishing a quick means of repeatering any two desired circuits together regardless of their geographical location in the operating department. The only alteration made in the connections of the multiplex apparatus after they have been hooked together is to shift the switch lever on one of the sets from the battery lead to a ground disc. That is to say, turn the lever to the right or left, as the case may require. The local battery from one set then furnishes the current for both sides, while the apparatus on the set where the lever was turned become simply "branch offices," assuming the polechanger and relay on that side are terminal stations in the same sense as the sounders at the end of a duplex loop in a broker office are terminals of the circuit.

The double conductor cords used in connecting two springjacks together are usually called "quad repeaters," not that they really are repeaters, but because they were first used principally to connect quadruplex and duplex apparatus together at the repeating station through the loopswitch board. By some these cords are called "run overs," "jumpers," "transfers," etc., according to one's fancy.

As the desk and loop local circuits of all multiplex apparatus are built up to a standard uniform value of resistance each conductor in the cord includes a lamp or other artificial resistance of like value inserted in series therewith in order to compensate for the loop resistance which is removed when the cord is substituted and the desk lever shifted to a dead ground. This is necessary in order to preserve the normal value of current in the local circuit after such connection has been made.

(To be continued.)

Recent Telegraph Patents.

A patent, No. 903,871, for electric telegraphy, has been granted to Isidor Kitsee, of Philadelphia. Means for impressing alternate positive and negative impulses of uniform duration on a cable, the intervals between impulses giving the code. Polarized syphon recorder used.

A patent, No. 904,157, for a combined telegraphic transmitter and typewriting machine, has been issued to Augustus G. Snyder, of Ilion, N. Y. A series of stationary contact pieces in an electric circuit for transmitting signals, a series of keys, and means for mechanically connecting the reciprocatory pieces to the keys at will.

A patent, No. 904,367, for a relay for telegraphs, has been awarded to James Scotland, of Hearts Content, Newfoundland. Has a cylindrical armor and core, each slotted, to assist in demagnetization, and insulation separating core from armor.

A patent, No. 904,768, for a telegraph system, has been taken out by Stephen D. Field, of Stockbridge, Mass. Increases speed of signals on long lines by impressing a counter-electromotive force on the line, counter to line current when circuit is opened to form signals.

A patent, No. 904,936, for a telegraph repeater, has been obtained by Lewis B. Cecil, of Santa Barbara, Cal. Comprises a main line and branch relay, a repeating device in connection with each relay, a mechanical means in connection with each repeating device for locking the armature of the other relay in closed position, when the armature of the first relay is open.

A patent, No. 904,952, for a combination trolley and telegraph pole, has been granted to James Hackett, of Bellaire, Ohio. The trolley pole is enameled and made of stepped sections, which narrow toward the top of the pole.

A patent, No. 905,628, for a telegraphic repeating apparatus, has been awarded to W. E. Athearn, of New York. A circuit having at each of two stations a current reversing transmitter and a polarized relay, a single transmission circuit which controls the transmitter at one station and is itself controlled by the relay at the same station.

The following patents have expired:

Patent No. 463,852, for a synchronous telegraph, held by C. S. Bradley, of Yonkers, N. Y.

Patent, No. 464,001, for a telegraph repeater, held by R. L. Atkinson, of Delaware Township, N. J.

Business Notice.

Mr. Charles Selden, Jr., a lawyer, of 1342 New York avenue, Washington, D. C., who has had eleven years practice, offers his services as a patent attorney. It is a well-known fact that a good many inventors do not always have their interests looked after with that nice sense of discriminating care and attention that they have a right to expect from attorneys to whom they confide their cases. Frequently the inventor has need of advice, suggestive and technical in character, calculated to aid him in bridging over difficulties encountered possibly in design, and to reach the best results. This is what Mr. Selden is well able to perform, for associated with him in an advisory capacity is his father, Charles Selden, the superintendent of telegraph of the Baltimore and Ohio Railroad, a well-known telegrapher and electrician of prominence.

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The Barclay Printing Telegraph System.

BY WILLIAM FINN.
(Part XIII.)

THE RECEIVING APPARATUS—CONTINUED.
THE PRINTER RELAY.

What is known as the "printer" relay is a polarized apparatus of the same resistance as, and in every other respect similar to the main line relay, portions of which were illustrated in Figs. 31 and 32 of the November 1 issue. Its adjustable parts are seen in Figs. 38 and 39, where P P represents a round brass plate having a circular groove c (Fig. 39) turned in its surface, the edges of the groove being undercut V-shape. A circular segment of brass, b, slides in this groove, and carries with it a block of ebonite, E, upon which are fixed the two contact

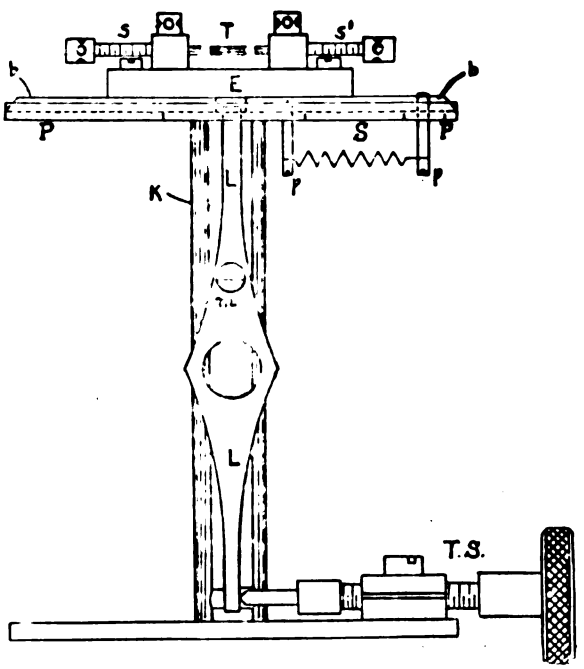

FIG. 38.—FRONT ELEVATION OF PRINTER RELAY, SHOWING ADJUSTABLE PARTS.

screws, s and s', between which the tongue, T, plays. By sliding the piece, b, round in the groove, c, it is evident that the position of the screws, s s', relative to the tongue, T, can be readily adjusted.

The movement of the sliding piece, b, is effected by the thumbscrew, TS, in the following manner: A pin, p (Fig. 38), is fixed to the sliding piece, and a second pin, p', is fastened to the stationary plate, P. A strong spiral spring, S, being hitched to these two pins, there is a tendency on the part of the sliding piece to be drawn round in the direction in which the hands of a watch turn. A brass lever, LL, approximately centered on the brass pillar, K, by the screw, m, has its upper end set loosely in a hole in the sliding piece, b, while its lower end banks against the adjusting screw, TS, so that by screwing the latter in a forward, or "marking" direction, the upper end of L is moved to the right, causing the slider to move in a corresponding direction. When TS is unscrewed, the spiral spring, S, pulls

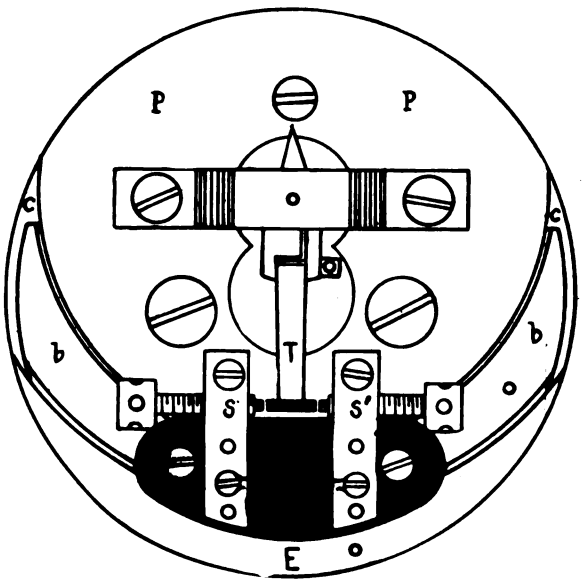

FIG. 39.—PRINTER RELAY: TOP VIEW OF FIGURE 38.

the sliding piece round in a reverse direction; thus the position of the contact screws can be finely adjusted.

The printer relay responds to current im-

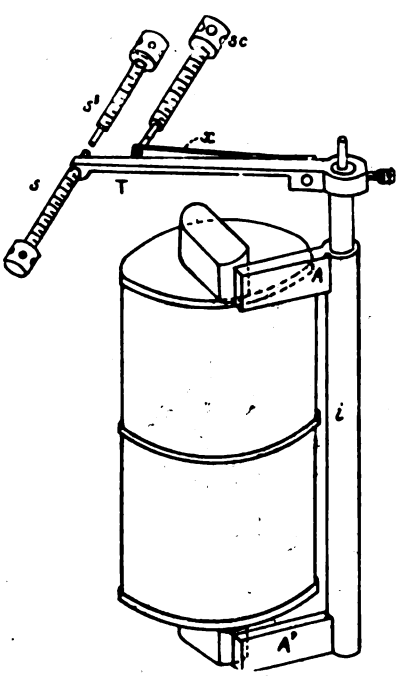

FIG. 40.—SEPARATOR RELAY.

pulses of every kind that come over the main line, and repeats them into the separator relay, and the escapement and synchronizing magnets of the sunflower. In order that it may operate to the best advantage, its armature tongue, T—

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like that of the main line relay—should have a play between its limiting stops, s s', approximately equal to one-sixty-fourth of an inch. The relay is first adjusted in the usual way by centering its armature lever so that it will remain

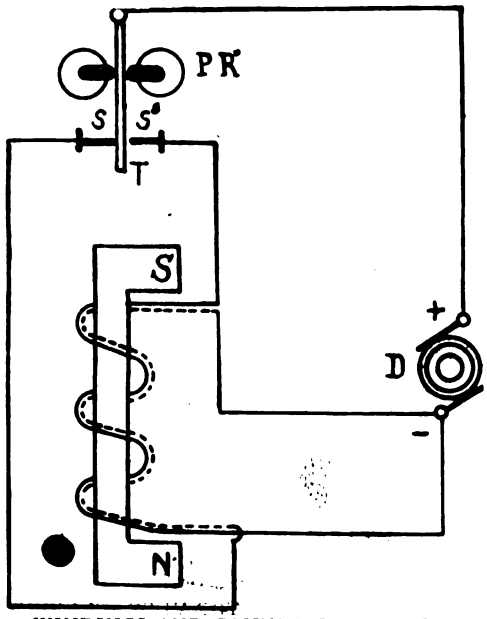

FIG. 41.—WINDINGS AND CONNECTIONS OF SEPARATOR RELAY TO OBVIATE EFFECTS OF RESIDUAL MAGNETISMS.

indifferently on either of its contact stops when placed there by the finger. This adjustmnt is usually made by means of the thumbscrew in the manner just indicated.

THE SEPARATOR RELAY.

The separator relay (Fig. 40), as its name implies, is an appliance employed in the printer system for separating the impulses of long duration from the impulses of short duration, and permitting only those of the former variety to pass into, and operate such of the distributing relays as may be required for the purpose of selecting a printer magnet. It is to all intents and purposes a common neutral relay, having a single soft iron core of the shape shown in Fig. 41, upon which are placed the two separate windings (shown also in Fig. 42) forming portions of the two branch circuits of which mention was made in the previous issue. The two windings, as will be seen, parallel each other along the entire length of the core (Fig. 41) and are so connected with the printer relay, PR' and dynamo, D, that when the tongue, T, vibrates between its stops, s s', the current enters one winding from one side, and the other winding from the opposite side of the separator relay, thus changing the direction of flow through that instrument and reversing its magnetic polarity with every oscillation of the tongue, T. This arrangement tends to quicken the action of the relay, by wiping out the residual magnetism that would otherwise remain in the core at the end

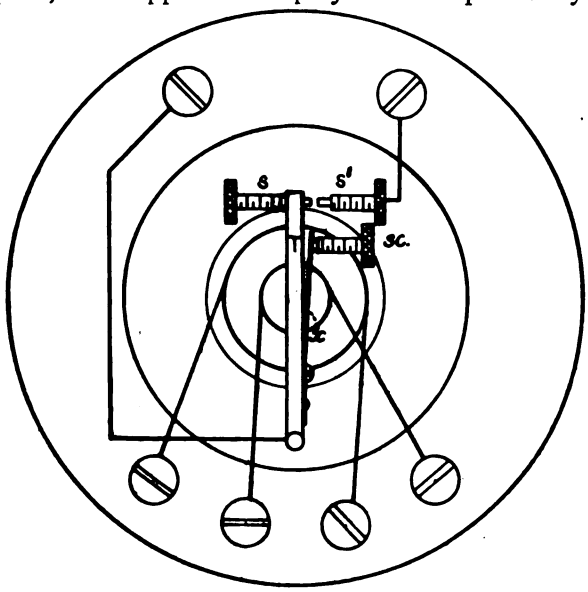

FIG. 42.—SEPARATOR RELAY PLAN OF WINDING.

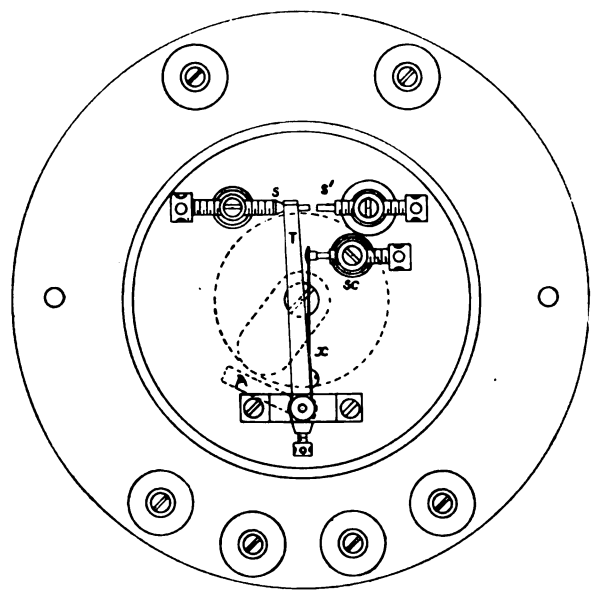

FIG. 43.—TOP VIEW OF SEPARATOR RELAY.

of each impulse, if the current were permitted to traverse each winding in the same direction.

In order to diminish the magnetic "reluctance" of this particular form of relay, the armature, A A' (Fig. 40), are connected together by a soft iron rod (i), through which the magnetic lines may complete their circuit and thus increase the magnetic pull for any given current value.

The spiral spring of the ordinary neutral relay is replaced in this instrument by a flat flexible retractile spring, x, the tension of which may be increased or diminished by means of the adjustable screw, sc. This spring is fastened to one side of the armature lever or tongue, T, the free end of which should have a play between its limiting stops, s, s', equal to about three-sixty-fourths of an inch. The tension of the spring, x, should be regulated with sufficient nicety to prevent the relay from being actuated by the reversals of the distant transmitter when the latter is running without slip at the working

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speed, the adjustment being correct when there is just the least tendency on the part of the armature to vibrate under these conditions. An adjustment of this kind will admit of a certain amount of variation in the speed of the transmitter without detriment to the working; but any abnormal change in the rate of working would call for a fresh adjustment. For, it will be evident, that any considerable increase in the running of the transmitter would tend to shorten the dashes, which might not then be sufficiently prolonged to operate the relay, in which case the tension of the retractile spring would have to be reduced. If, on the other hand, the speed should be so lowered that the dots would have a tendency to become as long as dashes, the spring tension would have to be increased in order to make the relay insensible to them.

Under normal working conditions, as has been previously pointed out, the armature lever of this relay (a top view of which is illustrated in Fig. 43) should lightly rest against, or tend to vibrate upon its back stop, s, under current impulses of dot duration, and only make contact upon its front stop, s', when the impulses of either polarity are of the required dash duration.

(To be continued.)

Personal.

Mrs. Brant, wife of the late John Brant, secretary of the Old Time Telegraphers' and Historical Association, is spending a few weeks at Mount Clemens, Mich., where she is taking the baths for the benefit of her health. Mrs. Brant expects to visit Europe in the spring, where she will spend several months in travel.

Mr. Donald McNicol, manager of the Postal Telegraph-Cable Company at Salt Lake City, an electrician of ability, whose writings on the subject of the telegraph, including that of wireless telegraphy, have been well received, recently delivered a very instructive lecture on wireless telegraphy before the Young Men's Christian Association of his city.

Postal Telegraph-Cable Company.

EXECUTIVE OFFICES.

Executive officers who have recently been absent on business connected with the service include Charles C. Adams, vice-president, who visited Baltimore, Md.; Theodore L. Cuyler, Jr., assistant treasurer, who made a trip to Kansas City, Mo., and E. B. Pillsbury, general superintendent, who looked over a number of offices in the Eastern Division located in Pennsylvania.

Mr. C. F. Fox, superintendent at Des Moines, Iowa, having resigned, to take effect on January 1, the offices composing his district have been placed under the superintendency of A. B. Richards, whose headquarters are at Kansas City, Mo.

Mr. J. E. Rowe, well known in telegraph circles in Western Pennsylvania, has been appointed manager of the Titusville, Pa., office.

A Rowland printing telegraph duplex has been installed on the New York-Baltimore circuit. Rowland octoplex circuits are now in operation between New York and Boston and between New York and Philadelphia. Rowland equipment is also in use between New York and Chicago and Chicago and St. Louis, and will soon be installed between New York and Pittsburg.

PRESENTATION TO L. W. STORROR.

Leonard W. Storror, the former general superintendent of the Postal Telegraph Cable Company, at San Francisco, was the recipient on November 21 of a beautiful gift tendered by former associates. It consisted of a diamond ring, valued at $500, and a heavy silverplate, the latter bearing the inscription, "L. W. Storror, from the Employes of the Pacific Division, Postal Telegraph-Cable Company, as a Token of Esteem and Affection, 1908." The presentation was made at Mr. Storror's home at Berkeley, just across the bay from San Francisco, by a committee composed of Superintendent William Hearn, George W. Holt, manager of the San Francisco office, and by Miss Marie Casossa. Mr. Storror while in office held a warm place in the respect and affection of the Postal forces on the Pacific Coast, and this testimonial was a concrete expression of that esteem, regret at his retirement from active duty and an assurance of continual attachment.

Augusta, Ga., Has a New Postal Office.

The Postal Telegraph-Cable Company occupied its new office at 765, 767 Broad street, Augusta, Ga., on November 29, removing thence from the corner of Broad and Jackson streets. The new offices of the company are as conveniently situated for the public as the old location, and everything in the building is new and the most modern in the way of telegraph equipment.

The office, in charge of Manager M. H. H. Duvall, is one of the largest the company operates in the Southern States, employing more than seventy-five people.

The business office is on the ground floor and is conveniently arranged and attractively fitted. Connection is had with the operating department, which is located on the second floor, by pneumatic tubes of the latest type, and by a private intercommunicating telephone system. The operating department, under the supervision of F. L. Wood, on the second floor, is fitted up in keeping with the business office, and every convenience is provided for the comfort of the employees and the rapid handling of business.

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Western Union Telegraph Company.

EXECUTIVE OFFICES.

Myron T. Wilbur, treasurer of the company, died at his residence in New York, on December 9. An obituary of Mr. Wilbur will be found elsewhere.

A. R. Brewer has been named acting treasurer of the company, and Lewis Dresdner has been appointed acting treasurer of the American District Telegraph Company of New Jersey.

Mr. E. B. Saylor, superintendent of Pittsburg, and who is the president of the Old Time Telegraphers' and Historical Association, was a recent visitor. He was accompanied by N. E. Church, manager of the office at Pittsburg.

A. L. Fish, of the electrical engineer's office, is on the Pacific Coast, where he is engaged in installing Barclay printers. The equipment will include the San Francisco-Los Angeles circuit, San Francisco-Portland circuit and San Francisco-Seattle circuit. Later a like circuit will be established between San Francisco and Chicago.

The supply department of the company, of which Horace E. Roberts is superintendent, and located at 152-154 Franklin street, New York, was completely destroyed by fire on December 8, entailing a heavy loss. Mr. Roberts was equal to the emergency, however, and within a few hours' time established new headquarters in the annex to this building at 14 Dey street, which he will probably occupy until a new structure can be erected on the Franklin street site.

This company has now about 5,000 money transfer offices. This branch of the service is being rapidly developed under the direction of William Holmes, superintendent of tariffs.

DEATH OF TREASURER WILBUR.

Myron T. Wilbur, treasurer of the Western Union Telegraph Company, New York, died of diabetes on December 9, after an illness of two weeks. The announcement came as a great shock to Mr. Wilbur's official associates and friends. While it was known that he was not in the best of health of late, it was not supposed that he was seriously ill until within a few days of his demise. Mr. Wilbur attended the Carnegie dinner on November 27, and greeted his friends on that occasion with his accustomed cheerfulness and good nature.

Mr. Wilbur was a native of Walworth, N. Y., the date of his birth being October 16, 1849. He entered the service of the Western Union Telegraph Company at the instance of his uncle, the late Judge Palmer, as a clerk, on May 13, 1869. He was later promoted to be cashier of the company, and in 1881 was appointed assistant treasurer, succeeding to the treasurership on the death of R. H. Rochester, which occurred November 27, 1907. Mr. Wilbur was the treasurer of the Gold and Stock Telegraph Company, the Southern and Atlantic, the Pacific and Atlantic, the Franklin telegraph, Delaware River Telegraph Company, and about forty other subsidiary companies to the Western Union Telegraph Company. He was treasurer also of the American District Telegraph Company of New Jersey. The funeral services were held at his late residence in New York, 221 West One Hundred and Thirty-Sixth Street, on the evening of December 11, and were numerously attended, many of the officials of the company being present.

Statement of the Western Union Telegraph Company.

The Western Union Telegraph Company, on December 9, declared a quarterly dividend of three-quarters of one per cent., for the quarter ending December 1, 1908.

The following statement exhibits the condition of the company at the close of the quarter ended September 30, 1908:

Surplus July 1, 1908, as per last quarterly report		$14,393,856.44
Net revenues, quarter ended September 30, 1908		1,864,954.97
		$16,258,811.41
From which appropriating for—		
Dividend of ½ per cent., paid October 15, 1908.	$497,820.50	
Interest on bonded debt.	433,062.50	930,883.00
Left surplus September 30, 1908...		$15,327,928.41

The following statement exhibits the estimated condition of the company at the close of the quarter ending December 31, 1908:

Surplus, September 30, 1908, as above		$15,327,928.41
The net revenues of the quarter ending December 31, instant, based upon nearly completed returns for October, partial returns for November, and estimating the business for December, will be about	$2,000,000.00	
Less interest on bonded debt	433,062.50	
Leaves estimated net earnings for the quarter, less interest on bonded debt		$1,566,937.50
		$16,894,865.91
It requires for a dividend of three-fourths of one per cent. on capital stock issued about		746,822.02
Deducting which, leaves a surplus, after paying dividend, of		$16,148,043.89

In view of the preceding statements, the com-

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mittee recommends the adoption by the board of the following:

Resolved, That a dividend of three-fourths of one per cent. on the capital stock of this company be hereby declared payable on and after the 15th day of January next, to stockholders of record at the close of business on the 19th day of December, instant.

The net earnings of the September quarter are $164,954 more than the estimate submitted at the September board meeting. The estimated net earnings for the quarter ending December 31, 1908, are $1,566,937.50, or at the rate of 6.28 per cent. per annum. This estimate is $1,196,057.03 more than the earnings for the corresponding quarter of last year, during part of which the strike prevailed, and $45,000 more than the net earnings for the corresponding quarter of two years ago.

J. H. Dorsey, Postal Chief Operator at Los Angeles, California.

Jackson H. Dorsey, whose advancement to be chief operator of the Postal Telegraph-Cable

JACKSON H. DORSEY,
Chief Operator, Postal Telegraph-Cable Company, Los Angeles, Calif.

Company at Los Angeles, Cal., was recorded in Telegraph Age, December 1, elevates to that position one who has made an exceedingly creditable record in that office. Mr. Dorsey was born at Litchfield, Mich., November 22, 1870. Learning to telegraph, his entry into the service was in the capacity of an operator in the employ of the Michigan Central Railroad, at Albion, that State, June 28, 1887. Here he remained for four years, subsequently serving Western Union interests as manager at various points in Michigan and Indiana. Going to Chicago he there became an operator for the Western Union Telegraph Company and afterwards for the Postal, making that city his home for several years. In 1902 he went to Los Angeles, entering the Postal service at that point. After six years of faithful service, during which time Mr. Dorsey pursued a careful course of study, he was promoted to be assistant chief operator, an advance quickly followed by another, to that of chief operator, on November 1, last, succeeding Vail V. Stevenson, who was made manager.

The Cable.

The cable steamer Mackay-Bennett, Captain Fred H. Larnder, belonging to the Commercial Cable Company, is in the harbor of New York undergoing her annual survey. When this work is completed she will return to her station at Halifax, N. S.

Cable communication is interrupted December 14 with:

Venezuela	Jan. 12, 1906
Madura Island (Dutch East Indies)	Feb. 3, 1908
Macao	Aug. 29, 1908

Messages can be mailed from Hongkong,

Hayti	Nov. 23, 1908

Private messages for the interior not accepted.

A New Edition of Maver's "American Telegraphy."

A new edition of Maver's "American Telegraphy and Encyclopedia of the Telegraph" is now ready for delivery. This will be known as the 1909 edition. The more important additions to the work at this time are descriptions of the Murray Printing Telegraph as now used in Europe, and of the Barclay Long Distance Printer, as operated on the lines of the Western Union Telegraph Company. This standard work on telegraphy now contains 668 pages and 492 diagrams. The new edition comes out in a new and distinguishing cover of dark green cloth. This book is a library on telegraphy in all its branches. It is used as a text-book in some of the largest universities in this country. It is written in plain English and practically without recourse to mathematics; hence it comes within the comprehension of the veriest beginner. No aspiring telegrapher can afford to be without it. This fine work will be sent to any address, carrying charges prepaid, on receipt of price, $5.00, by J. B. Taltavall, Telegraph Age, 253 Broadway, New York.

Unveiling of an Ampere Tablet.

At Ampere, N. J., on December 3, the French Ambassador, M. Jules Jusserand, unveiled a tablet to the memory of his distinguished fellow countryman and townsman, Andre-Marie Ampere, the famous French physicist. The tablet is the gift of Dr. S. S. Wheeler, and is placed in the beautiful new railroad station at Ampere, built recently by the Delaware and Lackawanna Railroad Company. The tablet bears the following inscription:

"In honor of Andre-Marie Ampere, who founded the science of electro-dynamics, and whose name is used throughout the world to designate the unit of electric current."

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Radio-Telegraphy.

In the recent French army maneuvers a wireless telegraph station in a balloon successfully intercepted messages sent from Berlin to vessels at sea.

A patent, No. 905,537, for a receiver arrangement for wireless telegraphy, has been granted to Gerhard Jahy, of Berlin, Germany. The antenna is not grounded, but is led through a coil of wire and connected with one pole of the coherer. The end of the coil at which the antenna enters into the interior of the coil is connected with the other pole of the coherer. The other end of the coil is grounded. Responds to very feeble waves.

Mr. S. S. Bogart, vice-president of the United Wireless Telegraph Company, New York, in a recent communication to Telegraph Age, writes: "We are constantly making additions to the list of marine and shore stations, and the power and range of communication of various stations is being increased from time to time. At present the company is operating twenty-two land stations on the Atlantic Coast, and eighteen on the Pacific Coast. In addition to these there are eighty-eight marine stations, maintained on seagoing vessels on the Atlantic Ocean, and twenty on the Pacific. We are now building and installing apparatus for the Dominican Republic, the Mexican Republic, and in Brazil on the Amazon River."

Father Joseph Murgas, of Wilkes Barre, who has invented an underground wireless telegraphy system, said a few days ago that plans had been perfected for establishing a service between that city and Binghamton. The underground stations consist of two tubes, thirty feet long, to be driven in the ground. One is of aluminum coated with silver and this is incased in a tube containing oil. Father Murgas says he will be able to send a wireless underground message from New York to San Francisco with only three repeating intermediate stations. He uses a Morse alphabet, but the dots and dashes are given by musical tones through finely adjusted sending and receiving instruments.

Radio-telegraphic communication with balloons has successfully been maintained in several instances recently, notably by the Condor, which rose from Brussels and exchanged signals with a station erected on the tower of the Palais de Justice, of Brussels., says an exchange The aeronauts also easily overheard signals sent from the French military station on the Eiffel Tower. The possibility of such signals had long ago been established; danger was, however, feared from the sparks. The first person systematically to experiment in this line was Hergesell, who, while cruising on the ocean, sent up unmanned balloons from the ship. The balloons were fitted with small receiving apparatus, tuned to different wave lengths on the different balloons, and the arrangement was such that the signal would open the valve of the respective balloon. Hergesell succeeded in bringing certain balloons down again at will at a distance of ten nautical miles.

The Wonders of Wireless.

Few people realize the growth and present extent of the wireless telegraph system in this country. Considering the tremendous obstacles to be overcome, the distances to be covered and the thousand and one hindrances, the expansion of the idea from the time the first company was formed in 1900 to the present date is nothing short of marvelous.

The first patent connected with wireless telegraphy was taken out in 1872 by Mahlon Loomis. Nothing was done with it, however, and it was not until 1886 that the subject was again taken up in the way of a patent. From that time to the present, many inventors have been working on the project.

To-day there are over fifty wireless stations on the coast lines of the United States which keep vessels at sea in constant communication with the land. The Government maintains practically as many at its coast stations, including nine stations in Alaska. The Government also has stations in Cuba and Porto Rico.

There are thirty-two steamship lines having vessels equipped with wireless apparatus and a majority of the United States battleships are so equipped. The Marconi system has about fifteen steamship lines with vessels plying between this country and Europe.

Apparently the possibilities of the wireless are unlimited. Even in its present somewhat crude state the results are almost beyond comprehension. The longest message on record without relay was sent last July when the American fleet was on its way from Honolulu to New Zealand. Admiral Sperry's flagship exchanged wireless messages from Point Loma, Cal., a distance of 2,900 miles.

The longest message with one relay was from Savannah, Ga., to the armored cruiser Pennsylvania, en route to Honolulu, a distance of 4,000 miles with a relay at Point Loma. The message traveled 2,070 miles over land and 1,930 over the sea.

It is said that a message can be flashed around the world in a minute and a half. But, consider the expense of wires and cables.

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The Telegraph Operator a Wanderer.

The telegraph operator is a wanderer by nature and by practice, remarked a correspondent recently. Ask any man you see pounding a key in New York if he is a native New Yorker, and nine times out of ten he was born in Kalamazoo, or Seattle, or Sioux City, or some other distant place.

There is usually a good demand for expert operators, so a man will give up a position in one city cheerfully and move on to another, feeling pretty certain that he'll land on his feet again. Take the thousands of men in this country who work for the Western Union or the Postal telegraph companies, for brokers, for newspapers, and for press associations, and you will find on inquiry that they have gridironed the United States and Canada, too, in their wanderings. Ask them why they are such a roving lot, and they will tell you they like to travel; that it's in their blood.

Perhaps one explanation for this roving spirit may be found in the genesis of the average telegraph operator. Most of them come originally from small towns. A boy of sixteen finds life in a small town irksome. He sees small opportunity for a start in life. Quite naturally he gets to know the one operator the place affords. In his idle moments, and they are many, he learns the code, and occasionally is allowed to sit in and send or receive easy messages. The day comes when the regular operator goes away to another town, and the youngster gets the place.

Now, given a young operator at his first job, and what do you find? For one thing, if he is good for anything at all, he will become proficient as soon as possible. He has to, for the man at the other end of the wire guys a novice unmercifully over every mistake. Then as he becomes proficient the young operator gets the desire to go elsewhere. It isn't ambition alone that prompts this move, although that enters in. He is in close constant touch with distant places. What more natural than that he should wish to go to those places and see for himself the things he has heard clicked off on the instrument.

So he begins to inquire of this and that man with whom he is in communication if there is a vacancy in sight. When he hears of an opening that looks good he applies for it at once by wire and maybe he gets his answer and the business is concluded in a short time. It is all so easy when it can be arranged by wire. The tests which most business men demand of men seeking employment don't call in his case for personal interviews. His proficiency may be tested at once on the wire.

Hence it comes that the young operator finds employment in a small city. But the wire calls him onward. He longs for the larger opportunity and the larger life of a big city. In a year or more he is in New York or Chicago or San Francisco. You might think that then he would settle down. But by that time he has acquired the fever of nomadism. He is just like the old tramp printer who is fast dying out, largely because of the increasing use of the typesetting machines.

The operator gets a few hundred dollars ahead and he quits on one pretense or another and moves on to some other place. After some years in the business he won't take the trouble to find out if there is a position ready for him where he is going. He takes the chance that he'll catch on somewhere.

There are about two things that will stop a telegrapher's wandering—marriage and the transition into some other line of work which demands that he stay in one place to succeed. If a telegraph operator marries his wife tends to restrict his wanderings. There have been some operators who continue to move about after marriage, but they are the exception. Comparatively speaking, only a small proportion of telegraphers marry, however, or at least marry early in life. The unattached ones, many of them, continue working their way from the Atlantic to the Pacific and back again, with diversions North and South.

When a telegrapher gets to be very proficient, is able to handle the Phillips code by which common words and phrases are reduced in sending to a few letters—has his own typewriter and can take matter at a rapid rate, he does not depend on the telegraph companies. He goes to work for a broker or a newspaper or a press association, which leases wires from the companies, and hires the operators. The pay is better and there is more opportunity to get into other lines of work.

So far these remarks have applied more particularly to what are known as commecial telegraphers. The operators who work for the railroads are classed separately.

Hundreds of men have got into newspaper work by way of the telegraph wire. Continual plugging away at press dispatches gives an operator a news sense and ability to write the English language. This is particularly true of the press associations. A knowledge of telegraphy is invaluable when it comes to disseminating the world's news almost as soon as it happens.

There is a certain lure about this trade which keeps many in it who have the opportunity but not the will or inclination to break away from it. The steady clicking of the sounder makes music which casts a spell. So the thousands keep on, while the hundreds quit, working and wandering with no fixed habitation or purpose in life.

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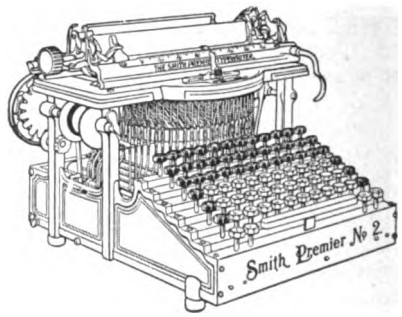

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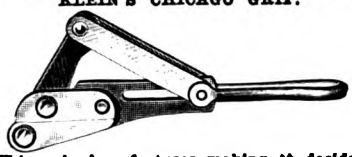

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DECEMBER 16, 1908.

The Book Department of Telegraph Age has always been a prominent and carefully conducted feature of this journal. The desire has been and is to furnish our readers and buyers everywhere the readiest means possible of securing such technical books as they may require. Aiding buyers in their selection with advance information, which at all times is cheerfully furnished; promptness in sending books, filling all orders on the same day of their receipt, has brought to this department a generous clientage. Catalogues fully covering the range of books treating on the telegraph, wireless telegraphy, the telephone, as well as those on the general subject of electricity, together with the principal cable codes, will be sent to any one asking for the same.

The Telegraph and the Interstate Commerce Commission.

President Roosevelt in his message to Congress places himself on record as favoring the putting of the telegraph as well as the telephone companies under the jurisdiction of the Interstate Commerce Commission. We must believe that the drift of modern thought in the domestic economy of our national progress and development is toward a larger governmental control of interstate business and traffic. It is natural perhaps that the common carrier interests should come under such jurisdiction. Nor can it be doubted that, generically speaking, such cognizance of public affairs by the government is wise, for it serves to keep within proper and legitimate bounds the conduct and operation of interests that in their magnitude, far reaching service and influence have become and are becoming strong and impressive powers within their individual scope. So it is that sooner or later the exercise of governmental control affecting in some measure at least all vast business undertakings is bound to gain a wider recognition in this country. It is inevitable apparently in the case of the telegraph. Manifestly the telegraph cannot, and logically will not, resist the adoption of a law of control nor claim exemption for its workings. And when such a law is created and a commission shall sit in arbitration, the telegraph will accept with good grace conditions as will then come into existence. All this perhaps goes without saying. This attitude should be obvious to all right thinking persons, and no need exists to pass any criticism on the position occupied by the telegraph in relation to this question.

On general principles, then, accepting the proposition of a widening of the functions of the Interstate Commerce Commission, it is questionable whether any betterment in the service or in the administration of telegraph affairs would follow as the result of the introduction of any external authority. The problems of management with which the telegraph companies are contending, constantly growing in intricacy, are many and varied, and only trained minds can be entrusted with their determination. In any event, if at all, the national government should be the sole outside regulating factor in telegraphic affairs, local commissions and laws of individual states, varying as they do in perception and purpose, too frequently meddlesome and irrelevent in character, as a rule creating antagonisms instead of promoting interests, which should be mutual in character, should be abrogated in favor of the higher tribunal of the government. The aim of the telegraph, like that of the railroads, is to serve the needs of the people at large without regard to the narrowing limits of state boundary lines, and in this purpose stumbling blocks should not be placed in their way, as is too frequently the case.

This country owes much to the telegraph. The inventor of the telegraph, from which he realized a fortune, as fortunes then went, and very properly so, was a man of high principle. Those who have followed him in the development and expansion of his invention, who successively have extended its use throughout not only the United States, but throughout the world, providing by its means the further enlightenment and civilization of mankind, have been men of probity, energy and, if you please, and necessarily so, men of capital—grand, let it be emphasized and remembered in their capacity for doing things. The men of to-day who are entrusted with the control of telegraph affairs are worthy successors of those who have gone before them. They are conducting the telegraph with ability and with honesty.

There may be graft, unholy combinations and commercial immorality extant in the business

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world, a check to which and its overthrow is demanded, but because this is so it does not follow that an entire moral collapse of the business interests of this country either exists or is impending, a thought that a reading of the full context of the President's message might easily convey, thus making it necessary for a more extended application of the idea of the Interstate Commerce Commission. The world is better to-day than it ever was before; honesty and integrity of purpose are dominant characteristics in the average business man, no matter what we may be told to the contrary. This is reflected in the gigantic, intense and strengthening fabric of commerce that binds men together, and which would be rent asunder if moral unsoundness in commercial matters were lacking. It is further observed in the growth of elecmosynary institutions physical expressions of human charity and kindness and good will towards others. But we do not desire to preach a sermon, only to illustrate a great truth. It ill becomes one in high authority to shake a mailed fist in the face of the business community. Our prosperity rests largely with our business men who do not offer "an ignorant resistance to every effort for the reform of abuses and for the readjustment of society to modern industrial conditions." Their demands are only for a fair and equitable consideration.

Mr. Carnegie's Honor Pensions.

SOCIETY OF THE UNITED STATES MILITARY TELEGRAPH CORPS.

Office of the Secretary,
658 Broadway, New York,
December 16, 1908.

Editor TELEGRAPH AGE:

Your readers generally, and the surviving members of the United States Military Telegraph Corps in particular, will be interested to know that Mr. Andrew Carnegie has extended the conditions of his "Honor Pension" of $12 per month, as specified in his letter of December 16, 1907, a copy of which was published in TELEGRAPH AGE of January 16, 1908, so as to include the widows of members of the corps who were married to such members prior to December 16, 1907, and who were living with their husbands at the time of their death and who have not since remarried. It is not intended that this grant shall apply to widows of members who died prior to the date above specified, nor, if any such there be, who may have married a member since that date. Application blanks will be furnished on request.

These honor pensions under the terms of Mr. Carnegie's letter above specified, are to continue only until Congress shall have passed the necessary measure which will give the members of our corps a pensionable status.

It will save the time of the executive committee if applicants for the Carnegie pension will in every case first see that a certificate of honorable service under the Act of Congress of January 26, 1897, has been issued by the Secretary of War.

The payment of these pensions to widows and also to surviving members whose claims shall have received or may receive the approval of the executive committee, will be made monthly, that is, $12 per month, instead of the yearly sum of $144.

The monthly payment of $12 in case of those whose claims have already been approved and whose checks have been issued for the yearly amount, will begin on the expiration of twelve months from the date of the yearly payment.

DAVID HOMER BATES
Secretary.

A New United States Military Telegraph Corps Bill in the House.

The Hon. Jacob Van Vechten Olcott, of New York, introduced on December 7 in the House of Representatives the following bill, No. 22275, which was referred to the Committee on Military Affairs, with instructions to print, and which was entitled "A bill for the relief of war telegraphers":

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the Secretary of War is hereby authorized and directed to issue certificates of honorable discharge from the United States Army to all persons who have received or who shall receive from the Secretary of War certificates of honorable service in the United States Military Telegraph Corps.

Senator Chauncey M. Depew, of New York, has written to several of his constituents, who are military telegraph operators, that he is heartily in favor of their claims as indicated in the printed petition, thousands of which have been forwarded to Congress with about 50,000 signatures coming from forty States in which the survivors of the Corps now reside.

Proceedings of the Reunion of the Old Time Telegraphers' and Historical Association.

Mr. F. J. Scherrer, of New York, the secretary of the Old Time Telegraphers' and Historical Association, has brought out the published proceedings of the twenty-seventh annual session of that organization, held at Niagara Falls, N. Y., on September 16, 17 and 18, 1908. This initial work of the new secretary, which makes its appearance in good time, is exceedingly well done, the subject matter receives thorough and careful treatment, the details of the meeting being fully reported, all of which goes to show industry and painstaking care in the compilation. The illustrations are numerous, the presswork excellent, the paper used being of a fine, heavy quality, making the printed page of text and illustrations unusually attractive and clear. Altogether the work measures well up to the best of the kind that has preceded it, and the members of the association will welcome its receipt as affording a concrete reflex of one of the most delightful reunions of the long series.

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Echoes of the "73" Carnegie Dinner.

The "73" birthday dinner given by telegraphers to Andrew Carnegie in New York, on November 21, has become a delightful memory. Pleasant remarks spoken in retrospect of the event are heard on all sides, for the graciousness of the affair, viewed both in the spirit of its tender and in its receipt, is acknowledged everywhere.

Among those invited to be present, and to occupy a seat at the guest's table, was Orrin S. Wood, the veteran telegrapher, the oldest living operator in the world, who reached his ninety-first birthday on December 14. While hoping to attend he was unavoidably absent, his condition of health at just this time making it inadvisable for him to go out. On the day following the dinner, David Homer Bates, chairman of the committee of arrangements, and secretary of the Society of the United States Military Telegraph Corps, wrote to Mr. Wood as follows:

Your note of yesterday and the one to Colonel Clowry duly received, and the order for your carriage, of course, countermanded, but with sincere regret.

It would have been worth while to have had with us last evening the operator who learned to telegraph in 1844 on the first telegraph line built and which was completed in that year.

We had one hundred and twelve guests, all of whom, with but few exceptions, had been at one time telegraph operators, including our honored guests, Mr. Carnegie and Mr. Edison.

Mr. Carnegie was in fine form and spirit and the dinner was a home-like, enjoyable affair, no highfaluten speeches from noted orators or after-dinner speakers, but just a family reunion. Every one entered into the enjoyment of the occasion and none more so than A. C. himself.

We were very sorry indeed not to have had you and your compeer, General Thomas T. Eckert, with us.

73 to both of you.

In our extended report of the occasion, published in the December 1 issue, the full text of the speeches delivered by Colonel A. B. Chandler, of New York, and of Richard O'Brien, of Scranton, Pa., did not appear. These are now given. Colonel Chandler said:

For a little more than fifty years I have rejoiced in the fact that I chose telegraphy for my life occupation, and during all these years I have pursued it in its various departments, with keen interest and without interruption. I have watched its growth and development closely and with great satisfaction.

Many of the very able and very useful men of our own and of other countries have grown up from their service as telegraph operators. One of these is the honored guest of this occasion, and no other one of them has attained such measure of commercial success as has been achieved by him. But the distinguishing merit of his career, as it seems to me, consists in the beneficent use which he has made of the fruit of his efforts—covering an extent of help for the education and uplift of the human race that is unmatched by the accomplishment of any other single individual in the history of the whole world.

Our fraternal signal of good wishes—"73"—has always had a charm for us that others than telegraph operators can hardly appreciate. But from this time forward, its significance will be especially emphasized by its application at this time in invoking blessings upon one who was once of our number, and who has now become seventy-three years young.

Here is what Mr. O'Brien said:

When I was very young I thought I could talk, but Mr. Carnegie cured me of that conceit.

Thomas A. Scott was then superintendent of the Pennsylvania Railroad at Altoona. Andrew Carnegie was his assistant. Tom Carnegie and John Pitcairn were the day operators and I was the night operator.

One day Tom Carnegie and I went trout fishing to a mountain stream near Altoona. Tom took along a valuable spaniel belonging to his sister. We fished all day and when we were about to return the dog attacked a large rattle-snake and was bitten on the shoulder. We managed to kill the snake, but the dog suffered greatly and was soon unable to walk, and although he was pretty heavy, we carried him home about two miles.

We were dead tired that night, and in spite of all I could do my head went down on the table more than once. I fear I did not get all that was passing on the wire. About midnight there was a freight wreck on the road. Fortunately I was not responsible, but I thought I knew who was, and in the morning, finding that another was charged with the accident, I spoke up rather freely in his defense.

That afternoon I was called into Mr. Carnegie's office and asked if I had made such a statement. I replied that I had. By this time Mr. Carnegie had all the facts before him and it did not take him long to show me that I was entirely wrong. He then said: "Richard, if you want to succeed in this business you must learn to keep your mouth shut and always remember that a close mouth is a sign of a wise head." I have never forgotten that lesson and have ever since been learning how to do it. It is now too late to change the plan.

I might add, however, that Mr. Carnegie did not lay that incident up against me. When the Civil War broke out he was appointed assistant general manager of government railroads and telegraphs, and in response to a telegram from him I went to Washington in company with three of the brightest and best telegraph boys on the Pennsylvania Railroad. Among whom was my friend David Homer Bates.

We arrived in Washington April 25, 1861, and I reported to Mr. Carnegie at the Baltimore and Ohio Railroad depot. I found he had been working there day and night getting the road and trains into safe running order. He set me to work and stood over me almost continuously day and night rushing troop trains into Washington until there were soldiers enough to safeguard the capitol.

Later he gave me one of the greatest pleasures I have ever had in life by securing for me the appointment of chief operator at headquarters Department Virginia and North Carolina, at Fortress Monroe. This took me to the front, where I wanted to go, and where General Eckert kept me throughout the war, giving me the free hand and strong backing which enabled me to do my share toward proving for the first time in history that the electric telegraph is invaluable in war, and that it very materially aided in the preservation of the Union.

I was with them at the front and on the battlefields of Virginia and North Carolina from the first to the close of the war, and I can truthfully say I do not believe the world has ever produced a braver, more faithful or more efficient body of men than the boys of the United States Military Telegraph Corps, of which Mr. Carnegie was the father.

Experiments are being made in Europe with telegraph poles made of glass. They will not rot of course, nor can they be destroyed by lightning or bugs. It is thought that some way will be found to keep them from breaking easily. If the average small boy of Europe is like his American cousin it will be quite a stunt to find a way to keep them from breaking easily.

Telegraph Age constitutes a "school of instruction" to every would-be telegrapher. It is accurate and authoritative and worth many times the price of subscription ($2.00) to any who would inform themselves respecting the telegraph.

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A Notable Decision Affecting the Liability of the Telegraph.

A decision was reached by the Court of Appeals of the State of New York, on November 10, in the case of Gilbert C. Halsted and Nettie M. Halsted, appellants, vs. the Postal Telegraph-Cable Company, respondent, which in its finding is of immense importance to telegraph interests. The questions of negligence and of the regulation of liability for errors by contract came up for review.

A résumé of the decision may be summarized as follows:

A mere error by a telegraph company in the transmission of a telegram will not, in the absence of any evidence of wilful misconduct on its part, warrant a jury in finding it guilty of gross negligence.

Where one requests another to send to him by telegraph the price at which he will furnish a certain article, and, pursuant to such request, a telegram is sent, but by error in transmission a wrong price is given, resulting in loss to the addressee, the latter is bound, with respect to any claim against the company for such loss by the contract made between the sender, as its agent, and the company, printed on the back of the telegram blank, to the effect that the company would only be liable for mistakes when the telegram was repeated.

A telegraph company may protect itself by contract and by reasonable regulations against liability for errors caused by the hazards of the business or the negligence of its servants, if not gross.

The plaintiffs brought this action to recover from the defendant the damage occasioned to them by the alleged negligence of the latter in erroneously transmitting to them a telegraphic message. The plaintiffs, being manufacturers of beef bags, in the City of New York, received from Armour and Company, of Chicago, a letter asking the lowest "price on 25,000 sets of bags," and they replied that they would telegraph them a price at a later time. The plaintiffs then requested the Cannon Manufacturing Company, of Concord, North Carolina, as they allege, "to send them by wire the price for 200,000 yards each of the narrow and wide light beef cotton goods." On July 27, 1903, they received through the defendant a telegram from Concord, addressed to them, which read: "Delivered commencing about August fifteenth, light narrow two eighth wide three eighth net," and was signed "Cannon Mfg. Co." Thereupon and on the same day, the plaintiffs telegraphed and wrote to Armour and Company a price, which was based on the quotations of the Cannon Manufacturing Company as they were given in the telegram. Armour and Company the same day telegraphed in reply an order for the bags and the order was entered by the plaintiffs. On July 28 plaintiffs ordered by telegram from the Cannon Manufacturing Company 175,000 yards of the narrow and 150,000 yards of the wide cloth, and at the same time wrote a letter to the company confirming the telegram. On July 29 plaintiffs received a letter from the Cannon Manufacturing Company inclosing a copy of the telegram which it had delivered to the defendant, and it then appeared that the message should have read: "Deliveries commencing about August fifteenth light narrow two eighty wide three eighty net." The difference between the telegraphic message as delivered to the defendant at Concord and as it was received by the plaintiffs at New York was that the word "deliveries" had become changed to "delivered" and that the two words "eighty" had become "eighth." It was shown that these quotations, which might not be very intelligible to the ordinary person, are well understood in the trade. The mistake made in the transmission of the quotations affected the contract made by the plaintiffs with the Armour company and caused a loss to them in the transaction. The plaintiffs endeavored to secure a cancellation of the contract with the Armour company by reason of the mistake in the telegram from the Cannon Manufacturing Company upon which it had been based, but they were unsuccessful. The Cannon Manufacturing Company refused to assume the liability for the mistake. The damages demanded in the complaint were in the amount of the loss to the plaintiffs on the Armour contract. The telegram from the Cannon Manufacturing Company was written upon one of defendant's blank forms, which read: "Send the following message subject to the terms on back hereof, which are hereby agreed to." That was followed by the plaintiffs' address, the quotations of prices and the signature of the Cannon Manufacturing Company. Below were the words: "Read the notice and agreement on back." One of the terms of the agreement referred to reads as follows: "To guard against mistakes or delays the sender of a message should order it repeated; that is, telegraphed back to the originating office for comparison. For this one-half the regular rate is charged in addition. It is agreed between the sender of the following message and this company that said company shall not be liable for mistakes or delays in the transmission or delivery or for non-delivery of any unrepeated message beyond the amount received for sending the same." There was also a stipulation limiting the liability of the telegraph company in the case of a repeated message unless specially insured in accordance with a provision for such insurance.

The defense of the defendant, beyond a denial of the negligence alleged with respect to the transmission of the telegram from Concord, was based upon the terms of the contract between it and the sender of the message. There was no evidence of negligence in the transmission of the message, other than in the changes made in the message between its delivery to the defendant and its receipt by the plaintiffs. There was evidence that atmospheric and electrical conditions and disturbances might affect the accurate transmission of a telegraph message; although the possibility of such changes being caused thereby in the symbols, or signals, as were affected in this case, was somewhat in dispute upon the evidence of the experts.

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Motions of the defendant to dismiss the action at the close of the plaintiffs' case and at the close of the whole case were denied, and the trial court submitted to the jury the question whether the defendant was guilty of gross negligence in the performance of its undertaking. The court, upon a request of the defendant further to instruct the jury that "the terms and conditions on the blank * * * are reasonable and valid and constitute a contract between the parties," ruled that they were reasonable and valid and constituted a contract between the company and the sender, "but not with the plaintiffs." To which ruling the plaintiffs excepted. A verdict was rendered for the plaintiffs for the amount claimed. Upon appeal to the Appellate Division, that court, by a divided vote of the justices, upon questions of law only, reversed the judgment which the plaintiffs had recovered and granted a new trial. The plaintiffs have appealed to this court from the order of reversal.

The decision of the court was delivered by Judge Gray as follows:

It is the plaintiffs' claim that the defendant is liable to them, as the addressees of the telegraphic message, for the failure to properly perform its duty, from which liability it was not relieved by the terms of its contract with the sender of the message. The argument is made that the defendant, as a public service corporation, "owes a duty to the public, for the breach of which a party injured has a right of action which is unaffected by any contract of limitation to which the injured person is not a party," notwithstanding the duty was undertaken by reason of such contract. So far as the plaintiffs' claim was predicated upon the alleged gross negligence of the defendant in the performance of the undertaking to transmit to them the telegraphic message from the sender in North Carolina, it is sufficient to say that the evidence wholly failed to make out any case for the jury on that theory. It showed simply the commission of an error, which, so far as material in its consequences, occurred in the change of the word "eighty" to "eighth." The letter "y" was changed to the letter "h" in two instances. Whether such changes were the inadvertent or mistaken act of the receiving operator or of any operator at the relay station or whether they were the result of atmospheric disturbances or of perturbances of the electrical fluid to which, concededly, the transmission of telegraphic messages is more or less subject, is not material. The nature of the undertaking by a telegraph company suggests the possibility, if not the probability, of peculiar risks affecting it, whether in the one or the other way. However occurring, if by no willful misconduct, a mere mistake or error in the transmission of a message would not warrant a jury in finding that there had been more than ordinary negligence (see Breese v. U. S. Tel. Co., 48 N. Y., 132; Primrose v. Tel. Co., 154 U. S., 1). The hazards attending upon the accurate performance by telegraph corporations of their function of transmitting messages are obvious, and the prudential character of such regulations as this defendant had adopted in order to guard against inaccuracy in transmission and to prevent mistakes from any cause is evident. The importance of accuracy to the parties cannot always be apparent to the operator, but it is to the sender. Where the wording of a message is such as to be obscure in its meaning or unintelligible to the ordinary reader mistakes are reasonably possible in the transcribing. In any case, the regulations of the telegraph company afford the means of making accuracy reasonably certain or of effecting insurance against mistakes.

The question in this case must be, what legal relation did the defendant sustain to the plaintiffs, or what was the measure of the duty owing by the defendant and of its responsibility for a failure in performance? Was the duty an absolute one, as claimed by the appellants, or was the undertaking one within the terms of the contract with the sender? In my opinion the contract was binding upon the appellants and relieved the defendant of any liability beyond that stipulated for.

In the Appellate Division it was held by a majority of the learned justices, in effect, that the defendant had the right to make the regulations which prescribed its liability in accepting messages for transmission, and that "whether the action is deemed to rest upon the contract of the sender or to result from a breach of duty, the limitation of the amount of damages to be recovered being reasonable, the plaintiff has no standing to maintain this action unless he is the real principal in the action, and then only to the extent of the amount paid for the transmission of the message." The dissenting justices took the view that as the contract of the defendant with respect to its liability was only with the sender of the message, the plaintiffs, as the receivers, were not bound by it, and that their action rested on a negligent breach of the duty owing by the defendant to deliver the message as received. It was said that "telegraph companies, being under a public duty to receivers of messages, senders of messages cannot by contract lessen or do away with that duty. They may only do so in respect of the duty due to themselves."

For the decision of this case it is unnecessary that the court should go as far as did the Appellate Division in the prevailing opinion in defining the general responsibility of the defendant towards the addressee of a message. It was alleged in this complaint that the "plaintiffs requested the Cannon Manufacturing Company * * * to send them *by wire* the prices" for the goods, and such was shown to be the fact by the evidence of the plaintiffs. The Cannon Manufacturing Company, therefore, in transmitting the information requested by means of the telegraph, was made the agent of the plaintiffs for that purpose. The plaintiffs, not desiring to await a communication from the Cannon company in the ordinary way of a letter, availed themselves of the latter's services and authorized them to employ the telegraph system for sending a reply. In doing so the sender was either the plaintiffs' agent in making the contract with the defendant or it made the contract for their benefit. While in either view the result would be the same, in so far that the plaintiffs would come under the obligation of the contract with the defendant, it is probably the more correct view that the Cannon Manufacturing Company acted as the agent of the plaintiffs in contracting for the conveyance of its message by a telegraph line. If that be true, the plaintiffs must be concluded by the act of their agent. The Cannon Manufacturing Company had a reasonable latitude of action in entering into such a contract, and that the terms of the contract as made were reasonable must be regarded as settled upon authority.

The defendant, while it may be likened to a common carrier in its occupation of conveying messages from and to all persons, unlike a common carrier of goods, does not become an insurer in their transmission. Its duties are performed in a different way. The reasons for making common carriers of goods insurers of their value do not apply in the case of telegraph systems, for there is no custody of goods, and the conveyance of messages is subject to the contingencies of extraneous disturbances beyond the control of the telegraph owner, or to the fallibility of operators in transcribing by signals, or symbols, or in comprehending the message itself as written. By reason of the franchises and powers accorded to it, a telegraph corporation performs public functions and it comes under that general obligation to which all quasi-public corporations are subject to conduct its corporate business, and to discharge the duties incident thereto with reasonable diligence and with a due care for the rights and interests of those concerned in the corporate operations. But, however strictly held to this general obligation, it is competent for it to make such rules and to prescribe such regulations for the conduct of its business as are reasonable. It is entitled to protect itself against the incidental hazards of operation and, by contract, to limit its liability for mistakes,

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or delays, or non-delivery, caused by the negligence of its servants, if not gross (Breese v U. S. Tel. Co., 48 N. Y., 132; Young v. W. U. Tel. Co., 65 ib., 163; Kiley v. W. U. Tel Co., 109 ib., 231; Pearsall v. W. U. Tel. Co., 124 ib., 256-267; Primrose v. W. U. Tel. Co., 154 U. S., 1-15). In each of the cases cited, the contract with the telegraph company was upon printed blanks, similar to the one which the sender of the message in question made use of. In the Pearsall case (supra) the question passed upon was whether the sender of a mesage was chargeable with constructive notice of resolutions of the defendant limiting its liability for an unrepeated message. While holding that mere notice was ineffectual to limit the liability for a failure to accurately transmit—and upon that there was a sharp division in the court—the right of a telegraph company to contract for such limitation was considered to be settled. The stipulations upon these blanks have invariably been held in this State (New York) to be reasonable, as they have been by the United States Supreme Court, and in many of the states. The decision in the case of Ellis v. Amer. Tel. Co. (95 Mass., 226), largely quoted from in the prevailing opinion below, turned upon the general right of the receiver of a telegraphic message to hold a telegraph company responsible for the damage resulting from material errors occurring in the transmission of the message. In that case, as in this, there was an error in the quotation of a price. The Massachusetts Supreme Court held that the liability of the telegraph company to the receiver of the message was generally limited by the contract upon the blank to the amount received by the company from the sender, where the message had not been repeated. It was held there, in effect, that the regulation adopted by the telegraph company for the repetition of a message, in order to guard against mistakes, was a most reasonable requisition, and that, notwithstanding the receiver had entered into no express contract with the company, and could not be held to have made any express stipulations with it, he could not claim any higher or different degree of diligence than was stipulated for between the sender of the message and the telegraph company. This case was cited with approval as to the general rule in Pearsall v. W. U. Tel. Co. (124 N. Y., at p. 270). If it were necessary in this case to determine the measure of liability of the defendant generally to the receiver of a message for the loss occasioned by some mistake or error in its transmission, my personal judgment would incline me to agree with the view of the Massachusetts court. The English courts have refused to recognize a right of action in the addressee of a telegraphic message for a failure to accurately transmit it for want of any privity of contract (Dickson v. Reuter Tel. Co., 2 C. P. Div., 62), and, while that right is accorded here for negligence in performing a duty, I fail to perceive any sufficient reason why, in a case of failure not due to gross negligence, the telegraph company should be held to a higher degree of diligence and care than was stipulated for with the sender. But the facts of this case do not make it necessary to go so far, and our decision is limited to those facts. It is our judgment that where the receiver of a message has, by a special request, procured it to be sent by the telegraph, he becomes bound by any reasonable contract made by the sender with the telegraph company for its transmission and is limited in his claim for any damages for a loss occasioned by error or mistake in transmission, where the stipulations for the repetition or for the insurance of the message have not been availed of, to the amount stipulated in the contract.

In the two cases in this court to which our attention is directed by the appellants nothing in their decision authorizes or even points to a different view of the question. In the case of Ellwood v. W. U. Tel. Co. (45 N. Y., 549) the action was brought by the receiver of the message and the defendant was shown to have been guilty of gross negligence. There was no error or mistake in the message transmitted, but the fault of the telegraph company was in delivering a message purporting to be from the cashier of a bank when it was known by the operator that that officer had not signed the telegraphic message. The telegram directed the payment of money to a person named, and when first transmitted the message was signed simply in the name of the bank. The plaintiffs, to whom the message was addressed, called the attention of the telegraph company to the fact that the name of the officer of the bank was wanting. It was sent back for repetition, and, as repeated, bore the name of the cashier. It was shown that the operator knew that both messages were written by a person who was not the cashier of the bank and who was known by the same name as that of the person to whom the telegram authorized the payment of the money. In the case of Lowery v. W. U. Tel. Co. (60 N. Y., 198) the plaintiff was the receiver of a message and sued the defendant for a loss occasioned by reason of a change in the figures of a sum of money which the sender asked of him. Upon receiving a larger sum from the plaintiff the sender of the telegram misappropriated it and absconded. The plaintiff recovered a judgment for his loss, which eventually was reversed in this court, upon the ground that the defendant's negligence was not the natural and proximate cause of the loss sustained by the plaintiff, as the embezzlement did not naturally result from the wrong of the defendant. The terms of the sending do not appear in the report of the case, and no reference is made to the subject. The appellants' reference to the printed record shows a contract governed by the law of Illinois, according to the determination made below, which differed from the law in this state. The case is of no authority upon the determination of the question in this case.

The contention of the appellants that the printed blank was insufficient to limit the defendant's liability for negligence is quite untenable. It was not necessary that the word "negligence" should be used in the stipulations of the contract. It was a sufficient protection to the defendant that the contract required a repetition of the message, or an insurance, in order to make the defendant liable for mistakes or delays in the transmission or delivery beyond the amount received for sending the same. Such mistakes or delays, whether caused by the negligence of the defendant's servants, if not gross, as by willful misconduct or by causes beyond its control, were covered sufficiently by the clause of the contract.

I think that the plaintiffs failed to make any case against the defendant for the recovery of the damage claimed to have resulted to them by reason of the error or mistake in the message, as transmitted, and the trial court was in error in submitting the case to the jury upon the theory that the stipulations on the printed blank upon which the message was sent were not binding upon the plaintiffs. For the reasons given I advise the affirmance of the order of reversal, and that judgment absolute should be rendered against the appellants, pursuant to the stipulation in their notice of appeal, with costs to the respondent in all the courts.

CULLEN, Ch. J.: VANN, WERNER, WILLARD BARTLETT, HISCOCK AND CHASE, JJ., concur.

Ordered accordingly.

"Sketches Old and New," by Walter P. Phillips, is a handsomely bound volume of 164 pages of interesting and charmingly told telegraph stories; one of the very best works of the kind ever published, and which will appeal strongly to every telegrapher; price, $1.

Every telegrapher who loves his profession, who is determined to master its technicalities, and thus insure for himself the confidence and respect of his official superiors and place himself in the direct line of promotion, should subscribe for and become a careful reader of Telegraph Age.

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Professor Bell's Prophecies Respecting the Telephone.

If someone should tell you that, thirty years ago, before such a thing as a central office was in existence, a definite prediction regarding the development of the telephone foretold not merely central offices, but aerial and underground cable, multiple cable distribution, toll service, private branch exchanges for hotels and offices, speaking tube installations, free trial service and measured service, probably you would doubt the assertion and demand proof. Yet such predictions appear in the following letter written by Professor Bell. Professor Morse made similar prophetic predictions regarding the telegraph. Professor Bell's letter is as follows:

Kensington, March 25, 1878.

To the Capitalists of the Electric Telephone Company:

Gentlemen:—It has been suggested that at this, our first meeting, I should lay before you a few ideas concerning the future of the electric telephone, together with any suggestions that occur to me in regard to the best mode of introducing the instrument to the public.

The telephone may be briefly described as an electrical contrivance for reproducing in distant places the tones and articulations of a speaker's voice, so that conversation can be carried on by word of mouth, between persons in different rooms, in different streets or in different towns.

The great advantage it possesses over every other form of electrical apparatus consists in the fact that it requires no skill to operate the instrument. All other telegraphic machines produce signals which require to be translated by experts, and such instruments are therefore extremely limited in their application, but the telephone actually speaks, and for this reason it can be utilized for nearly every purpose for which speech is employed.

The chief obstacle to the universal use of electricity as a means of communication between distant points has been the skill required to operate telegraphic instruments. The invention of automatic printing, telegraphic dial instruments, etc., has materially reduced the amount of skill required, but has introduced a new element of difficulty in the shape of increased expense. Simplicity of operation has been obtained by complication of the parts of the machine—so that such instruments are much more expensive than those usually employed by skilled electricians. The simple and inexpensive nature of the telephone, on the other hand, renders it possible to connect every man's house, office or manufactory with a central station, so as to give him the benefit of direct telephonic communication with his neighbors, at a cost not greater than that incurred by gas or water.

At the present time we have a perfect network of gas pipes and water pipes throughout our large cities. We have main pipes laid under the streets communicating by side pipes, with the various dwellings, enabling the members to draw their supplies of gas and water from a common source.

In a similar manner it is conceivable that cables of telephone wires could be laid underground, or suspended overhead, communicating by branch wires with private dwellings, country houses, shops, manufactories, etc.—uniting them through the main cable with a central office, where the wire could be connected as desired, establishing direct communication between any two places in the city. Such a plan as this, though impracticable at the present moment, will, I firmly believe, be the outcome of the introduction of the telephone to the public. Not only so, but I believe in the future, wires will unite the head offices of telephone companies in different cities and a man in one part of the country may communicate by word of mouth with another in a distant place.

I am aware that such ideas may appear to you utopian and out of place, for we are met together for the purpose of discussing not the future of the telephone, but its present.

Believing, however, as I do, that such a scheme will be the ultimate result of the telephone to the public I will impress upon you all the advisability of keeping this end in view, that all present arrangements of the telephone may be eventually realized in this grand system.

The plan usually presented in regard to private telegraphs is to lease such lines to private individuals, or to companies at a fixed annual rental. This plan should be adopted by you, but instead of erecting a line directly from one to another I would advise you to bring the wires from the two points to the office of the company and there connect them together; if this plan be followed a large number of wires would soon be centered in the telephone office where they would be easily accessible for testing purposes. In places remote from the office of the company, simple testing boxes could be erected for the telephone wires of that neighborhood, and these testing places could at any time be converted into central offices when the lessees of the telephone desire inter-communication.

In regard to other present uses for the telephone, the instrument can be supplied as cheaply as to compete on favorable terms with speaking tubes, bells and annunciators, as a means of communication between different parts of the house. This seems to be a favorable application of the telephone, not only on account of the large number of telephones, that would be wanted, but because it would lead eventually to the plan of inter-communication referred to above; I would, therefore, recommend that special arrangements should be made for the introduction of the telephone into hotels and private buildings in place of the speaking tubes and annunciators, at present employed. Telephones sold for this purpose could

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be stamped or numbered in such a way as to distinguish them from those employed for business purposes, and an agreement could be signed by the purchaser that the telephones should become forfeited to the company if used for other purposes than those specified in the agreement.

It is probable that such a use of the telephone would speedily become popular, and that as the public became accustomed to the telephone in their house, they would recognize the advantages of a system of inter-communication. When this times arrives, I would advise the company to place telephones free of charge for a specified period in a few of the principal shops so as to offer to those householders who work with the central office, the additional advantages of oral communication with their trades-people. The central office system once inaugurated in this manner would inevitably grow to enormous proportions, for these shop-keepers would thus be induced to employ the telephone and as such connections with the central office increased in number, so would the advantages to householders become more apparent, and the number of subscribers increased.

Should this plan ever be adopted, the company should employ a man in each central office for the purpose of connecting the wires as directed. A fixed annual rental could be charged for the use of the wires, or a toll could be levied. As all connections would necessarily be made at the central office, it would be easy to note the time during which any wires were connected and to make a charge accordingly. Bills could be sent in periodically. However small the rate of charge might be, the revenue would probably be something enormous.

In conclusion, I would say that it seems to me that the telephone should immediately be brought prominently before the public, as a means of communication between bankers, merchants, manufacturers, wholesale and retail dealers, dock companies, water companies, police officers, fire stations, newspaper offices, hospitals and public buildings, and for use in railway offices, in mines and (?) operations.

Arrangements should also be speedily concluded for the use of the telephone in the army and navy and by the postal telegraph department.

Although there is a great field for the telephone in the immediate present, I believe there is still greater in the future.

By bearing in mind the great object to be ultimately achieved, I believe that the telephone company can not only secure for itself a business of the most remunerative kind, but also benefit the public in a way that has never previously been attempted.

I am, gentlemen, Your obedient servant,

(Signed) ALEXANDER GRAHAM BELL.

Through the Book Department of TELEGRAPH AGE you can obtain any book desired. Send for the new catalogue.

A Telegraph Official Circularizes His Division, Urging the Benefits of Study.

The circular letter which follows below addressed to "All Employes," has been issued by G. E. Paine, assistant general superintendent of the Postal Telegraph-Cable Company, at Atlanta, Ga.

An effort such as this to stimulate study and consequently to increase efficiency among telegraph employes, is highly commendable. It is a pointing out of the way, missionary work of the highest character. It shows an honest desire on the part of executive management to aid in promoting the betterment of those under them. The underlying motive governing the issuance of this circular and all other efforts of like character, of which instances are becoming numerous, to elevate the general welfare in the telegraph service by advancing information, should not be lost upon those whose benefit is intended. The act is not promoted by selnshness, although in the results sought the telegraph would derive benefit, and very properly so; but the effect on the willing and receptive mind of the individual, would be such as to better and more quickly fit him for promotion; and the telegraph, as we have so often said, has urgent need of the services of better educated men, men with a broader technical understanding of their avocation. Here is the circular:

Postal Telegraph-Cable Company.

Office of the Assistant General Superintendent.

Circular No. 117.

Atlanta, Ga., Oct. 28, 1908.

All Employes:—I often wonder why, in view of all we have previously said on the subject, our managers, operators, clerks and linemen all do not seem to realize the benefits which would surely follow to them if they would provide themselves with a few inexpensive books and study the subject of electricity as applied to the telegraph.

A good, cheap book to begin with is Jones' Pocket Edition of Diagrams ($1.50); a better and more interesting one is Maver's American Telegraphy ($5.00). Either of these can be secured for you by local book sellers, or from Telegraph Age, 253 Broadway, New York.

If only one page a day is gone over, each one would be surprised to see what beneficial progress has been made in six months and very much more in a year.

Students should not be discouraged because the subject may at first seem a difficult one, but should re-read each page until it is understood. It is not especially difficult, but it will take time and study and a good deal of it, just as it took a great deal of time (though you have probably forgotten it) to learn to read and write and to understand arithmetic.

We will be glad to help any employe at any time if some problem comes up which he or she cannot understand.

I hope every employe will have an opportunity to read this letter, and if any are encouraged thereby to fit themselves for better positions, or to better perform the duties of their present positions, I shall feel many times repaid for this and all previous "missionary work" of this character which it has been my pleasure to perform.

Sincerely,

G. E. PAINE,

Assistant General Superintendent.

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The Artom System of Radiotelegraphy.

Whoever has followed in the slightest the marvelous development of wireless telegraphy must certainly be aware of the serious difficulties that were in the way of the practical application of this wonderful method of communication, says Professor Alessandro Artom in a communication to the Italian Electrotechnical Association, and printed in the Electrical Review and Western Electrician. It happened continuously that wireless messages sent by a certain transmitting station were caught by all the receiving stations within the circle comprising the average transmitting distance of the station. Atmospheric electricity also caused serious disturbances, so that at times the service had to be suspended for hours. It was necessary to give to the phenomenon of the propagation and reception of the electric waves a much more definite character, and, in order to meet the exigencies of practice, it was necessary to develop systems of radiotelegraphy which would make it possible (1) to send the effects of the transmitting apparatus mostly in one definite direction—that is, to find means of directing the electric waves; (2) to render the receiving apparatus most sensitive to waves coming from a certain direction; (3) to prevent the serious disturbances due to atmospheric electricity; (4) to make the receiving apparatus insensitive to waves emanating from extraneous transmitters. Artom says:

"When the work of Marconi was first announced it occurred to me that for a practical solution of the problems mentioned he might have turned to the use of phase difference between two or more electrical oscillations. To produce practically a difference of phase between two Hertzian vibrations of the order employed in wireless telegraphy appeared at that time impossible, but later the idea spread and it is now applied in numerous wireless systems. In my own work I have found it most useful to employ rotating electric and magnetic fields generated by two electrical oscillations differing in phase for proving the existence of phase differences.

"The rotating magnetic field is generated by two windings, through one of which flows the principal oscillating current, and through the other a current induced by means of a small transformer of a few turns. The existence of the rotating magnetic field can be easily demonstrated by introducing an armature into the field. The existence of very high-frequency rotating electrostatic fields may be demonstrated in various ways, for example, by the use of a Braun tube, which obviously is also eminently suitable for showing the magnetic field. In order to influence the cathode beam of the Braun tube by the vibrations of the high-frequency electric field it is only necessary to fasten to the neck of the tube, a little below the diaphragm, two pairs of tinfoil strips, properly insulated, at right angles to each other on the periphery of the tube, and connect the strips with four points of the oscillating circuit, between which there exist differences of potential out of phase. The effects of a rotating electric field may thus be easily observed; the cathodic spot describes open elliptical forms manifesting themselves in the shape of spirals, since the oscillations are damped. These elliptical forms, according to which the electric lines of force, resulting from the composition of two electrical oscillations of different phase arrange themselves, may conveniently represent a transverse section of a beam of rays of electric force analogous to a beam of light polarized elliptically. Having thus demonstrated experimentally the composition and interference of two electrical vibrations, I endeavored to apply the effect to wireless transmitting and receiving apparatus with a view of producing unsymmetrical electromagnetic fields and devised for this purpose a number of arrangements of aerial conductors which constitute one of the characteristics of my system of radiotelegraphy. These consist of two or three aerial conductors inclined toward each other at angles which may vary from zero to 180 degrees, but which may generally be most conveniently chosen between forty-five and ninety degrees. When oscillatory currents of displaced phase are sent into aerial conductors arranged in this manner they possess remarkable properties regarding transmission as well as receiving, as experiments made under the auspices of the Italian Royal Navy have shown. As regards the transmitting aerials, the following facts will be observed at once: (1) in the aerials inclined toward each other the mutual induction is very small, when oscillating currents flow through them. This fact permits of establishing absolutely in advance the period of oscillation to be used in the transmission; (2) the inclination of the aerials toward each other serves to produce the phenomena of composition and interference between electromagnetic waves emitted by two conductors, because it compels a superposition of the respective beams of electric magnetic lines of force; (3) when connected to an oscillator or to a receiver, these two aerial conductors constitute an arrangement that is in electrical equilibrium, in the sense that the electrical capacities of the two branches, with regard to the earth, are of remarkably equal value, so that the ground connection of the transmitting as well as receiving apparata may be eliminated, as has been demonstrated in practice. This is of practical advantage.

"The various types of aerials shown are approximately equal in their effects, but the triangular arrangement presents some practical advantages in that it requires only one mast. Experience has shown, furthermore, that with this arrangement it is possible to obtain quite well conditions of syntony between transmitter and receiver.

"The characteristic property of the transmitting apparatus is the production of a profoundly unsymmetrical magnetic field, that is, directed electric waves, as the experiments made by the Royal Italian Navy have demonstrated. The use of in-

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clined aerials alone evidently constitutes a reason for the unsymmetrical character of the effects. But an experience of years has demonstrated a property, which is also possessed by some other systems using two aerials, namely, that the axis of propagation according to which the electromagnetic effect reaches the greatest distances may be perpendicular to the plane of the aerials, or it may lie in the plane of the aerials themselves. When the oscillating currents in the aerials are made to differ in intensity as well as in phase, that is, if they are of different amplitude, this axis of greatest propagation may be inclined in any direction with respect to the plane of the aerials. This fact is useful in practice, as a wireless telegraph station should evidently be able to meet any special conditions imposed by its topographical position.

"In fact, it is possible to vary the constructive elements or form of these aerials as well as their electrical elements, that is, the amplitude and phases of the oscillating currents by which they are excited. Furthermore, supplementary aerials may be added which will greatly reduce the radiation in the direction of the plane of the aerials. Their effect is evidently to generate interfering fields, or fields opposite in sign to the principal electromagnetic field. In experiments made in 1904, in which these aerials were lengthened and arranged almost horizontally in the direction of the receiving station, an increase of radiation in that direction was observed.

"As has been stated, the electrical elements of the apparatus may also be varied; it may be operated with or without ground connection, the difference of phase between the currents may be varied from zero to 180 degrees, and the relation of the amplitude between the two currents may be made to differ. Thus it will be seen that with the arrangement described it is possible to obtain curves of distribution of energy corresponding to the most widely differing azimuth angles, these curves being the natural consequence of the arrangement devised by me.

"In order to apply the idea of phase difference to the reception of signals I devised various types of receiving apparatus, but the one that proved most successful was an arrangement resembling the differential galvanometer. Three coils are arranged on a core which may be of insulating material or of iron wires. The central coil is connected to any kind of electric wave detector. Alongside of the central coil are two other coils, each of which has one of its terminals connected to one of the two antennæ, the other ends are joined together and may be connected to the ground or not. These two coils may be made to act by induction on the central coil in such a way that their effects are either in opposition or in accord. When they act in accord on the central coil and the apparatus is connected to the ground, it will receive signals like an ordinary aerial from whatever direction they may come. But when the two receiving antennæ are arranged in the plane of the waves arriving from the transmitter, the waves strike first one aerial and, after a certain time, the other one that is further removed from the transmitter. The magnetic flux generated in the two coils induces currents in the central coil, which is connected to the detector and behaves according to known laws. Assuming, on the other hand, that the two aerials are affected at the same instant, then the flux generated in the two coils is equal, of the same phase and opposite in direction, and the effect on the induced circuit connected to the detector is practically nil. The result is that from all transmitting stations outside of the plane of the receiving aerials, and more particularly from those stations in a perpendicular direction, the electromagnetic effects arrive at the two receiving aerials at the same instant and the receiving apparatus is not sensitive to them. The same is true in the case of electric waves due to atmospheric electricity. When the ground connection is eliminated the two coils may be dispensed with and the apparatus assumes a simple form, and its operation is then principally due to the electromotive force resulting from the magnetic flux traversing the space included by the aerials. The effect is maximum when transmitting and receiving aerials lie in the same plane. This physical fact was made use of by me in the fall of 1905 with very good results for determining the position of transmitting stations on vessels and on land.

"The selective properties of my receiver with triangular aerials have been made still more distinct by the use of electromagnetic syntony, and special apparatus were invented in which, in addition, local syntony was employed, that is, the apparatus has a slow natural period of vibration at which alone it will operate. This local syntony is determined, as regards the transmitter, by the low-frequency current feeding the coils or transformers and, as regards the receiver, by a very weak alternating current under the influence of which only the receiver can act. This apparatus was devised about two years ago, and in experiments made proved to be very sensitive and well suited as a receiver in wireless telephony."

Among a number of books on the market treating of the general subject of train despatching, that bearing the generic title of "The Train Dispatcher," written by A. W. Early, a train despatcher himself, has gained a wide popularity, its value beirg based on the fact that it is one of the best bool s of the kind ever produced. It supplies a certain practical information of a class desired by the ambitious worker as a guide and inspiration to him in his daily work. Its 104 well printed pages are packed full of educatory matter, and the volume should be, as it has been, a welcome possession to every telegraph operator and train despatcher in the railway service. This book will be sent to any address on receipt of price, $1.00. Address J. B. Taltavall, Telegraph Age, 253 Broadway, N. Y.

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The Way-Station Switchboard Explained and Light Thrown on Problems of Line Connection.

BY J. H. GINGRICH.
Chief Operator, Postal Telegraph-Cable Company, Harrisburg, Pa.

(From the Railroad Man's Magazine.)

One of the first duties of the new way-station telegrapher may be to "cross-connect" or otherwise change the wires, in order to "clear" a wire upon which the movement of trains depends, or to "make good" an important message circuit. It is not difficult to make these changes, and the principle of cross-connecting wires is simple and easily learned.

Nor is there anything complex about the switchboard itself; a few words will explain it. If the telegrapher will look at his switchboard, he will see a number of vertical brass straps, with binding-posts attached, to receive the line wires; also, a number of rows of little brass circles called disks, each disk being provided with an extension which passes through the board and connects with a wire or strap of copper running across the back of the board.

The number of horizontal wires or copper straps on the back of the board corresponds with the number of vertical straps in front. The binding-posts at the side of the board are connected with these transverse straps, and to these binding-posts the wires leading to the instruments are connected.

There is a cavity in each side of the disks, and a similar recess, directly opposite, in the adjoining vertical strap, so that a brass plug, provided for this purpose, inserted in the hole between strap and disk, connects them electrically. A pair of vertical straps are required for each wire in and out, and likewise a pair of horizontal straps on the back of the board, or rows of disks in front, which is all the same, are required for each set of instruments.

The first row of disks on the board are "grounded;" that is, a wire having been firmly wrapped around and soldered to a water-pipe, or otherwise securely fastened in moist earth, is connected to this row of disks. A plug inserted between any of these grounded disks and vertical straps "grounds" the wire connected to that strap.

The lightning arrester usually consists of a large round brass disk, located immediately under the line-posts and arranged to screw on a stud which passes out between, but does not touch the vertical straps. These studs are connected together on the back of the board, and are also permanently connected to the ground wire.

The brass disks are then screwed down close to, but not touching, the vertical straps, a space about large enough to admit one thickness of heavy writing-paper intervening. This space between the disk and strap presents an impassable barrier for the current in the wire; but the nature of the lightning discharge when it follows the wires is to jump from the brass straps, to which the wires are connected, to the disks which are connected with the ground wire; and the lightning is "arrested" in its course or diverted to the ground.

Should a conducting substance come between a line strap and an arrester disk, the wire connected to that strap will be grounded. It frequently happens during thunder-storms that lightning will fuse the disks, leaving little pieces of brass protruding from them which touch the vertical straps, and thus ground the wires. The disks, therefore, should be examined after thunder-storms and rubbed clean and bright with sandpaper.

The wires entering the modern way station, before reaching the lightning arrester, are provided with a little piece of fine wire, so arranged that it forms a part of the line wire; this piece of wire is called a "fuse," which will burn off, and thus open the line, should the line accidentally cross with an electric light or power circuit, or receive a heavy lightning discharge.

The instrument circuits are also protected with fuses. The fuse in the main line is usually designed to carry from ten to twenty amperes before fusing; and the fuse in the instrument circuit one-half ampere. When a fuse opens, the heavy current cannot enter the office, and the instruments are protected and a fire averted which might destroy the office itself.

Sometimes these fuse wires are broken by accident, and consequently the wire is open; but a fuse may be tested easily and quickly by spanning a piece of wire from one end of the fuse to the other, making contact, of course, with the wire on the metal at each end; if the fuse is open, the circuit will close through the spanning wire, which will be indicated by the closing of the instrument in that circuit. The wire should be insulated, except where contact is made.

Regarding the vertical straps of the switchboard as the ends or terminals of the line wires, and as conveniently arranged with respect to the transverse straps connecting the rows of disks together, it is at once apparent that these wires may be connected easily to the instruments or to each other.

When we wish to connect two wires, we simply pick out one of the wires, follow it down to the brass strap, and put in a plug connecting the wire with a disk. The disk is connected to the horizontal strap on the back of the board, so that we have now lengthened out the wire we are tracing, just as though we had connected a piece of wire to it, the extension, of course, being the strap on the back of the board, which extends across the entire width of the board.

Guided by the row of disks, we follow the strap on the back of the board until we meet the wire we wish to connect with, and another plug at this point completes the connection. We have thus, in effect, connected two line wires together, just

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as though we had taken them out of the binding-posts and wrapped their ends together.

But we have done it in infinitely less time and with infinitely less effort. Yet, simple as it is, there are still telegraphers here and there who prefer to make these connections by taking the wires out of their posts and twisting their ends together—a slow, laborious and altogether needless task. These telegraphers, no doubt, are satisfied to remain at the way station, satisfied with themselves, with the philosophy that the world is flat, and that there is nothing new under the sun.

The telegrapher who looks beyond the way station should bear in mind that his ability to speed dots and dashes will not alone qualify him for advancement.

A glance reveals the principle of cross-connecting wires on the switchboard just described—or, in fact, on any switchboard—for they are all the some in principle, though they differ in detail. This principle is obviously that of providing a path for each particular circuit, which shall not enter or conflict with the path of any other circuit.

Seasoning and Treating Telephone Pole Cross-Arms.

(From United States Forest Service.)

There are used every year in the United States about 14,000,000 cross-arms for telephone and telegraph poles. Of these, perhaps one-fourth are now treated with preservatives to increase their durability, and there are at least five plants, at New York City, Norfolk, Va., New Orleans and Sliddell, La., and West Pascagoula, Miss., at which cross-arms are treated. Because of their small size as compared with the strength required and the weakening effect of the holes for insulator pins, and their constant exposure to all kinds of weather, cross-arms should receive a thorough treatment. A good treatment with creosote will at least treble their durability.

A large portion of the supply of cross-arms comes from the South; they are sawed from the loblolly or old field pine, of which there is a large quantity throughout this region. This tree grows rapidly, but contains much sapwood, which is difficult to season. It has been said that "loblolly pine sapwood will rot before it will season in the warm, damp climate of the South." While this is probably overdrawn, it is necessary so to pile the cross-arms that the air may circulate freely about them, and to protect them from rain and snow by a roof of loose boards. By laying twenty cross-arms in a tier, two cross-arms at each side and two in the middle set on edge, and allowing a small space between each of the others, which are laid flat, favorable conditions for seasoning are established and no rotting will occur.

Sapwood absorbs preservative so much more rapidly than heartwood that when both cross-arms in which sapwood abounds and those in which heartwood predominates are treated in the same run the former absorb an excessive amount before the latter have received what they require. This is not only a needless expense but a detriment, inasmuch as the excess of creosote in the sapwood later oozes out and drips on those who walk beneath. To solve this difficulty, the cross-arms should be sorted in three classes, as sapwood, intermediate, and heartwood, and treated in different runs.

Cross-arms are treated in large horizontal cylinders varying from ninety to one hundred and eighty feet in length and from six to seven feet in diameter. Into these the arms are run on skeleton trucks, and the doors are then bolted air-tight. Creosote is next run until the remaining space in the cylinder is filled. Pressure is sometimes then applied by pumps to force the preservative into the wood. In some instances before the preservative treatment the cross-arms are treated to a bath of living steam followed by the drawing of a vacuum, to remove moisture and secure rapid penetration of the wood by the preservative. It is the opinion of the Forest Service, however, that the bath in steam is not necessary or desirable if the arms are properly air seasoned.

The Miniature Sounder at the Carnegie "73" Dinner.

The miniature telegraph sounder presented to each of the guests at the "73" dinner tendered recently by telegraphers to Mr. Carnegie, in New York, in honor of his seventy-third birthday, aroused much enthusiasm. The device was regarded as an eminently fitting souvenir of an occasion which drew together in the spirit of auld lang syne so many distinguished members of the craft, past and present, especially so as it was a perfect piece of mechanism and fully capable of performing the work required of a like instrument of normal size. The little affair, which is beautifully finished, was highly prized by the recipients at the dinner as being emblematic of the profession. Indeed, such was the interest shown that numerous inquiries have since reached Telegraph Age requesting to know if it was possible to procure duplicates of the same.

In recognition of the sentiment that has prompted these inquiries, the utility of the device itself, and its appropriateness as a holiday gift to and by a telegrapher, Telegraph Age has made arrangements by which it can fill all orders for the same. The key alone, the smallest ever manufactured and which is the same as the one presented at the memorial reunion of the Old Time and Military Telegraphers in New York in 1905, will be sent in a box to any address, carrying charges prepaid, on receipt of $1.50; the sounder at $2.50, or both at $4.00. Address J. B. Tallavall, Telegraph Age, 253 Broadway, New York. An advertisement of this key and sounder appears elsewhere in this issue.

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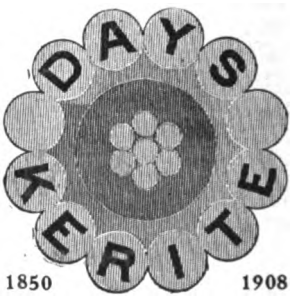

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The Railroad.

Mr. John F. Maguire, who has been appointed general manager of the Lehigh Valley Railroad Company, with headquarters at South Bethlehem, Pa., began his railroad career as a telegrapher, and has occupied almost every subordinate position in the railroad service prior to reaching the head of this system.

Miss Gladys Camp, daughter of W. J. Camp, of Montreal, electrical engineer of the Canadian Pacific Railway Company's Telegraph, and president of the Association of Railway Telegraph Superintendents, is visiting friends in New York and is at present a visitor at the home of Mr. E. P. Griffith, superintendent of telegraph of the Erie Railroad, at Passaic, N. J.

Mr. E. K. Dyer, son of I. T. Dyer, superintendent of telegraph of the San Pedro, Los Angeles and Salt Lake Railroad, at Los Angeles, is looking after the railroad interests on the Pacific Coast for the Western Electric Company. Mr. Dyer has had considerable experience in the electrical supply business and is well adapted to fill the requirements of his new position. His headquarters will be at San Francisco.

The Western Committee of the Association of Railway Telegraph Superintendents on systems located west of Buffalo and Pittsburg met in quarterly session at St. Paul, Minn., on December 14 and 15. The principal discussion of the meeting was "Telephone Train Dispatching." The delegates to the meeting were entertained at the Transportation Club, of which Harry C. Hope, superintendent of telegraph of the Chicago, St. Paul, Minneapolis and Omaha Railroad, is the president.

Mr. G. W. Dailey, superintendent of telegraph of the Chicago and Northwestern Railway, having been advanced to the position of superintendent of the western division of the road, the vacancy of superintendent of telegraph has been filled by the appointment of W. Bennett, who is advanced from the position of assistant division superintendent. Mr. Bennett's headquarters will be at Chicago. W. P. McFarlane is the assistant superintendent of telegraph of the system, with headquarters at Omaha.

Concerning the use of concrete telegraph poles along the line of the Pennsylvania Railroad, about which so much has found its way into print of late, Mr. G. A. Cellar, of Pittsburg, superintendent of telegraph of the Pennsylvania Lines West of Pittsburg, in writing to Telegraph Age on the subject said in a note: "We recently put up a mile of these poles, through the town of New Brighton, Pa. There are so many considerations bearing upon the use of concrete telegraph poles that I hesitate to attempt stating them in such a letter as I am able to write at this time. The cost of construction, as well as that of placing the poles in the line, is considerable, and the expansion of railroad properties may make the removal of any line a necessity within a few years, or the expansion of the telegraph service may cause the capacity of the line to be outgrown in a short time. There are many things which enter into the matter of use of these poles which can hardly be discussed within the limits of a letter, and must be deferred until the subject can be taken up in a personal interview."

The Underground Telegraph Extension In England.

The Associated Chambers of Commerce of the United Kingdom recently asked the Postmaster-General to lay underground telegraph wires to Land's End, so as to obviate the frequent interruption of telegraphic communication caused by storms, which interferes with the prompt transmission of telegrams from the East received over the Eastern Telegraph Company's cables at Land's End. The Postmaster-General replied that the wishes of the Chambers had long since been anticipated, for in his report for last year he expressed the hope that the underground line would reach Penzance during the current financial year, and he trusts no very long time may elapse before it is completed to Porthcurno.

Ohms Law Made Easy.

BY CARL OTTO, CHICAGO.

"E" stands for the pressure
Which we are taught to use,
Divided by "R," resistance,
Will give us "C," the juice.

$$\frac{E}{R} = C$$

"C" is "E divided by R,"
With this we don't get very far,
But "E" is "R times C," you see.

$$C = \frac{E}{R}$$

$$E = R \times C$$

And "R" is "E divided by C."

$$R = \frac{E}{C}$$

"W," watt is "Current times
Electromotive force,"

$$W = C \times E$$

And "seven forty-six" of them
The "Power of a horse."

$$746 = H.P$$

What was once the Speedwell Ironworks at Morristown, N. J., where Samuel F. B. Morse, the inventor of the telegraph, did much of his preliminary work in perfecting his telegraphic instruments, and where the first steam engine of the first steamship that crossed the Atlantic was built, has been destroyed by fire. For many years the building had been unoccupied.

Local patriotic societies made an effort to raise funds to preserve it as a landmark, but the proposition came too late. The ironworks were established by Colonel Jacob Arnold in 1776. In 1812 Judge Alfred Vail took over the plant and enlarged it, and, with Morse Alfred Vail made his experiments with the electro-magnetic telegraph.

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Standard Time and the Railway Association.

At the November meeting of the American Railway Association, resolutions were passed congratulating William F. Allen on the successful operation for a quarter of a century of the system of standard time originated by him and adopted in 1883. Mr. Allen replied as follows:

It was the enterprising spirit of the railway men of 1883 which made possible the adoption of Standard Time, and among them I must refer to the names of such men as P. P. Wright, E. B. Thomas, James McCrea, Charles E. Pugh, J. R. Kenly, Geo. W. Parker and H. S. Haines, all well known to you, and to those of J. M. Toucey, A. A. Talmage, H. B. Stone and Charles Stiff, who have passed away. They were all most active and important factors in support of the proposed reform. There are many others worthy of honorable mention, whom I should like to here recognize if time permitted.

Let us look back for a moment at the conditions that prevailed prior to November, 1883. There was then fifty-three times of various cities, in use by our railways and by the people generally, and it is doubtful if there were more than a dozen railway officials in the country who could have stated from memory what time was used upon any road other than their own and the few with whom they had direct business connections. To the traveler the puzzle was a difficult one, and without the aid of a guide almost impossible of solution. So crude were some of those standards that one railroad superintendent reported, in response to a circular of inquiry, that the standard of his road was "the superintendent's watch."

In the task of resolving this chaos into order, the political situation of affairs at that epoch was a fortunate one. The power of the national government and of the state governments was not evoked, nor was it desired, in the movement for the accomplishment of the reform. The cooperation of the officers of the Naval Observatory at Washington, and of the Signal Service department was most cordially given, because they recognized the advantage that would accrue to their respective services.

It had not then been announced as a political axiom, as it was recently, that "men accustomed to large affairs are somehow untrustworthy and must be restrained by those less competent, but more numerous at the polls."

The spasm of unjust prejudice against railways, fostered by ignorance of facts, and fed by personal ambition, now, we trust, about to pass away, had not then begun to exercise its baleful influence; nor had the adoption of unwise methods, for the correction of certain abuses, obstructed the operation and development of our transportation lines and injuriously affected the growth of the industries of our country. There were at the time many men of influence still living, who knew what the country was before our railways had been constructed by their enterprising builders, and who understood and appreciated the part they had played in its progress.

In other parts of the world similar movements of reform in time-keeping have since been accomplished by means of the enactment of laws or by Imperial decrees. Here (and in saying this I do not wish to appear to ignore the co-operation of scientific societies) standard time was practically the gift of the railways to the public. Following the intelligent leadership of our railroad officials in all parts of the country, the people acted for themselves in adopting the new time, and it was therefore essentially a movement "of the people, by the people, for the people," apart from politics or political influences. Then, having adopted the new custom, in pursuance of that liberty which governs the practices of a free people, they proceeded to enact their custom into law.

It is my belief that no government in this country has ever been strong enough (and I trust none ever will be) to impose upon the American people such a change, even for their common good, as the one they voluntarily adopted on November 18, 1883. Nor could it have been brought about by the government, with all its recent assumption of power, without the free and hearty cooperation of those forces, which then proved sufficient of themselves.

In view of recent existing conditions, I am constrained also to believe that the reform, successful in 1883, would have been hopeless of accomplishment if it had been attempted in 1908.

On that beautiful Sunday morning of November, 1883 (which many of you will recall), when the hour arrived at twelve, by the old time, in New York City, I heard the bells of St. Paul's chapel toll the old hour for the last time, followed by a fateful interval of four minutes. Then, as previously arranged, obedient to an electrical signal from the Naval Observatory at Washington, the Western Union time ball fell, old Trinity's chimes rang out on the new hour, and the chaos of local times over a whole continent was resolved into the order which has since prevailed.

Since then the work of The American Railway Association has steadily progressed onward and upward towards the attainment of the highest degree of efficiency in railway management and operation. You may raise rates as high as justice and reason will permit; you may borrow money for improvements at the lowest rate of interest; you may economize in every way possible; but without efficiency in operation all other things may go for naught. And I venture to assert that the degree of prosperity of any country is in direct proportion to the efficiency of the operation of its railways.

I regard The American Railway Association as having been a most potent factor in the advancement of that efficiency and that prosperity. It has never been in the hands of abler men than those of to-day. In thanking you most appreciatively for your action, I desire to say in return, that I know of no wish that will be more acceptable to you, nor one that I can more heartily

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extend, than that its labors may meet with the same success in the future as they have in the past.—Railroad Age Gazette.

Signalman Becomes a Harvard Lecturer.

James Fagan, a signalman in the employ of the Boston and Maine Railroad, stationed at a point just outside of Boston, abundantly illustrates in his career the possibilities that await the observant, the faithful and studious within the various spheres that furnish the environment of so many.

The little tower in which he has been working and thinking these twenty-two years is as dingy and unattractive as its surroundings, and is no different from the hundreds of other railroad signal towers scattered throughout the country. The steel levers, the clicking instrument, the dreary view up and down the tracks—the average student of economics would not consider these the most advantageous surroundings for mental effort, but here Fagan has learned enough about railroad problems to qualify him as a lecturer in Harvard University. Eight hours a day of work in the tower and almost as much again of study in his little home in Waltham have made him one of the most remarkable men in this country to-day.

He is now fifty years old. The first twenty-five years of his life were years of wandering and adventure; the last twenty-five have been years of observation and study. His birthplace is Inverness, Scotland, and there he passed the first ten years of his life. When he was ten years old he won a scholarship in a school in Manchester, and went there to study. Although he took the regular "classical course" of forty years ago, he was much interested in electrical subjects, and he specialized in electricity. Next he apprenticed himself to a cable-laying expedition, which took him from Portugal to Rio de Janiero, by way of the Canary Islands. For several years he worked in South America as a cable operator. Then he was caught up in the rush to the South African gold mines. In South Africa he fought against the Kaffirs as an enlisted soldier, and when the fighting trade was not good he spent his time as gold miner and trader. After the battle of Majuba Hill he decided that he had been in South Africa long enough and came to the United States. In 1881 he went to Boston, and got a position on the Boston and Lowell Railroad; in a few months he changed to the Fitchburg Railroad, and went to East Deerfield, Mass., where he worked for five years. The next and last change was to the signal tower in North Cambridge, where he has been since 1886.

All this shows where Mr. Fagan got his knowledge and experience, but it does not show how he got out of the rut into the public eye. No one can justly claim to have discovered him, for he discovered himself. Some time ago The Atlantic Monthly devoted a good deal of space to various articles on railroad problems. He read these articles with great interest, and he saw in them many statements which did not agree with his own experience. He thought it over for a while, and one day he went to call on the editor. He told the editor what he thought about it, and the editor's answer was, in effect, that if he did not like the way the articles were written he could try to do better.

He immediately started to write. The result of his efforts is the series which appeared under the title of "The Confessions of a Railroad Signalman." These articles are not of a nature which tends to increase our national pride in our railroad system, for they are in effect a rather severe arraignment of the management of all railroads in general, and of his own, the Boston and Maine, more particularly, but none of the railroads has sued The Atlantic Monthly for libel.

This series of articles brought him to the attention of the public, and it was not long before President Eliot called him to Cambridge to confer with him. President Eliot saw that he knew what he was talking about, and he appointed him to lecture before the new School of Business Administration. He will give a series of lectures next spring, but the subject and the exact time have not been decided on. Soon after his interview with President Eliot he was called to Washington for a conference with President Roosevelt. What passed between them has not been revealed. but Fagan's reputation was made.

His work is not at all destructive, and now that he has told what ought not to be done he is getting up a new series of articles telling what ought to be done, under the title of "The Industrial Dilemma." The answers of the railroads to the first series of articles have been chiefly of the "What else can we do" sort, and it will be interesting to see whether Mr. Fagan has gone deeply enough into the subject to tell them what they can do to improve things.

Just to fill in his spare time he is lecturing in different parts of the United States, now in Chicago, now before the convention of railroad surgeons in New York, or before the City Club of Boston, and he is beginning to make people believe that he is not "working for himself all the time," but at least part of the time for his ideals of what the American railroad ought to be.

And, finally, this altogether remarkable man works eight hours a day in the little dingy tower in North Cambridge when he is not speaking in some other part of the country, because "it keeps him in touch with his subject."

The Government of India contemplates the raising of the inland rates for telegrams by fifty per cent., the present rate, for so-called "deferred" messages, of 4d. for ten words, including address, having been found to involve a heavy loss. In future "ordinary" messages will be charged 6d. for twelve words, and "express" messages one rupee (1s. 4d.) for twelve words.

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Telegraphs Have Always Existed.

This is putting it pretty strong, and the fact may be a trifle overstated; but away back in ancient history we find that information was sent gliding over the world in very short order. In these days of all sorts of telegraphy, we are tempted to pity our remote forefathers for their not knowing what happened soon enough to take advantage of it; but they did very well, thanks.

Less than a day after a Roman emperor died, it was known all over his dominions—even to the furthest outpost of the furthest outlying armies. The same week that Alexander, the great Macedonian Emperor and General died, the whole civilized world was talking about it, and scheming how to take advantage of the unexpected event. When Antony was in Egypt with Cleopatra, they were always up to date in Rome, as to the progress of his wooing and the diminishing probabilities of his military success.

The early telegraphic systems largely grew out of the requirements of ancient military life. "We are such clever fellows nowadays," as a friend observed, that "we are apt to think that this age is the only one that has been able to communicate intelligence quickly;" but Aeschylus, in his Agamemnon, describes a system for the rapid communication of information by burning torches as signals.

The beacon, the fire-signal, burned on the lofty mountain tops, was, perhaps, the most primitive method by which the ancients transmitted a message from point to point. In the Book of Jeremiah there is a reference to the signal-fire to be kindled on top of the mountains: "Set up a sign of fire in Bethhaccerem; for evil appeareth out of the north, and great destruction."

The fire-signal was in use in ancient Persia, Palestine and Greece. By such means the Greek commander is represented to have conveyed to his queen, Clytemnestra, the intelligence of the fall of Troy, the news reaching Mycenæ, in the Peloponnesus, from Troy, in one night. Beacons were made to be effective by day as well as by night, the fire being so built that it would emit much or little smoke; light smoke indicated the graver nature of the intelligence and the need of caution, while dense smoke was mandatory, and meant prompt action; an Act of Parliament of Scotland, in 1455, directed that one signal-fire would be a warning of the approach of the English, and four fires would mean that they were in great force.

The American Indians had the idea of conveying intelligence by fire-signals, by flame and smoke, when first discovered by the whites. They used regular stations over the Western country; and the movements of Fremont, as he passed through their territory, were made known to them. In England there was a county-tax to continue the beacons in repair, and they were carefully looked after.

The ancient Greeks and Romans recognized the necessity of rapidly sending orders to a distant point and elaborated a system of communication, for military purposes, by means of torches. Telegraphy, with torches, is described by Polybius, who died about 122 B. C., and he calls the different instruments used for conveying information, pyrsiae, because the signals were always made by fire. The Romans filled pots with burning straw and twigs, saturated in oil, the flame of which was visible at a great distance; and by a previously-understood code messages were freely exchanged. By the lighting of a definite number of torches, and the order in which they were displayed, or extinguished, certain letters were indicated, and the result in words was made apparent. The Grecian commander, Aeneas, perfected a method which anticipated modern systems of communication, really conceiving the idea of the alphabet by signs.

Lights and torches at night could be so used as to indicate the alphabet of twenty-four letters, divided into three classes of eight letters each, and designated by one, two or three torches, and the number of the letter was signified by the number of times the torches were elevated. During the day flags were used; and the shields of the soldiers also, which, displayed in some understood manner reflected the rays of the sun, flashing an order or a piece of intelligence from one point to another. Such communications were the more readily transmitted, in those old fighting days, because every hilltop near to a military encampment had its sentry on the alert, and watch-towers were plentiful in all centers of population. For the ordinary purposes of communication, it was customary to have relays of trained runners, men of pith and sinew; and the custom prevails to-day among the African tribes and, perhaps, with the Indians of our own continent.

One peculiar and interesting signal contrivance of the Greeks, because of its equal efficiency for operating in any sort of country, merits a brief description. Two earthen vessels, identical in shape and size, provided with valves that would discharge an equal quantity of water from each vessel in precisely the same period, were placed at the two communicating stations. A piece of cork, floating on the surface of the water supported an upright blade of wood, on which were marked certain sentences; and the upright in one vessel was a duplicate of the one in the other vessel. It was scaled, and the sentences were inscribed within the various divisions. The flash of a lighted torch, which signified the wish to communicate, was answered by another, intimating that the receiver was ready. When the sender of the message extinguished his torch the valve in each vessel was opened, and it so remained until the sender relighted his torch, when the valve was instantly closed. Thus, by careful manipulation of the valve at each point, the same amount of water was run out and the sinking of the upright would be precisely the same in both vessels. The sentence on the division of the up-

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right on a level with the mouth of the vessel was the one the receiver would read, and thus obtain the necessary order or information.

So, by the means of fire, torch, shield, or flag, did the ancients communicate their news over long distances; and before the practical introduction of the electric telegraph there were many systems of visual signaling invented by the ingenious. Keppler, about 1600, in his "Concealed Arts," devised the plan of cutting out letters in the bottoms of casks, with a light inside the cask to make the letters luminous. Bishop Wilkins proposed a method of long-distance communication by means of two lights at the ends of long poles, which should be waved from side to side, to indicate certain letters, and suggested that the eye of the observer be assisted by the then newly-invented telescope.

A variety of systems were brought out in the seventeenth and eighteenth centuries, one of the best being that of Dr. Robert Hooke, whose attention had been directed to the necessity of quick communication at the siege of Vienna by the Turks, in 1684. The system consisted of twenty-four symbols, representing alphabetic characters, and six more were used as arbitrary signs. These were to be exposed in succession, hoisted by pulleys to a cross-beam connected to three high poles having a sky-line background on some conspicuous elevation, and being observed at a distant station they would be repeated and thence sent forward to the next. The letters were run into place in the required order of spelling, and the day symbols used were blocks of pine, with the addition of lights for night use.

Mr. Edgeworth, the father of the Irish authoress, Maria Edgeworth, used the sails of a common windmill, in 1767, for communicating intelligence; he called it the "Telelograph." The signals were made to represent numbers, the meaning of which was found in a dictionary where the words were numbered; and this system remained in vogue, for almost all military operations, until substituted by what is known as the Morse alphabet.

Perhaps the most perfect of the early machines for visual communication was the invention of the Frenchman, M. Chappe, in 1702, when the arts of war were fostered by the fathers of the French Revolution; and the method, being generally adopted, has continued in use, with improvements of minor importance.

It is not a little strange that the Italian historian, Strada, in 1617, very curiously indicated the system of modern telegraphy. He wrote: "By the help of a certain loadstone, which had such virtue in it that if it touched two several needles, when one of the needles so touched began to move, the other, though at ever so great a distance, moved at the same time and in the same manner. Two friends, being each of them possessed of one of these needles, made a kind of dial-plate, inscribing it with the four-and-twenty letters in the same manner as the hours of the day are marked upon the ordinary dial-plate. They then fixed one of the needles on each of these plates in such a manner that it could move round without impediment so as to touch any of the four-and-twenty letters. . . . . Accordingly, when they were some hundred miles asunder, each of them shut himself up in his closet, and immediately cast his eye upon the dial-plate. If he had a mind to write anything to his friend, he directed his needle to every letter that formed the words which he had occasion for, making a little pause at the end of every word or sentence to avoid confusion. The friend, in the meanwhile, saw his own sympathetic needle moving of itself to every letter which that of his correspondent pointed at. By this means they talked together across a whole continent, and conveyed their thoughts to one another in an instant over cities or mountains, seas or deserts."

In "Hakewell's Apology," printed at Oxford, 1639, the electric telegraph is prophesied in a marvelous manner; and Charles Marshall, a doctor of Renfrew, in a communication to the Scots Magazine, February, 1753, suggested the possible application of electricity to the purposes of the telegraph. In 1796, the British Government set up lines of communication from the Admiralty, in London, to different seaports of the kingdom, and announced "that one day last week information was conveyed from Dover to London (sixty-six miles) in the space of only seven minutes." John Boaz, of Glasgow, in 1800, obtained a patent for a system of signal telegraphy, with twenty-five lamps, arranged five in a row to form a square, and means were contrived to obscure letters not wanted in forming a desired word.

We pause on the threshold of the nineteenth century. The word telegraph, which is from the Greek, means "far-off writing;" and the realization of its true significance was dawning in the minds of men. Morse and Wheatstone were soon to astound the world by their discoveries. But the crude telegraphic methods of the ancient warriors and citizens are none the less worthy of admiring inspection in these late days, because the spark of electricity almost governs and arranges the work of the world.—Carlton's Magazine.

"Modern Practice of the Electric Telegraph" maintains its value as an excellent technical handbook for electricians, for telegraph managers and for operators. The fact that numerous editions of the book have been issued proclaims its intrinsic worth. The author, the late Franklin Leonard Pope, was a former president of the American Institute of Electrical Engineers, a member of the Institution of Electrical Engineers of London, an old-time telegrapher, and a writer of marked ability. The volume embraces 234 pages, has 185 illustrations and is fully indexed. Price, $1.50, postpaid. Address J. B. Taltavall, TELEGRAPH AGE, 253 Broadway, New York.

The articles under the standing head of "Some Points on Electricity," published regularly in TELEGRAPH AGE, are filled with practical information for the up-to-date operator. Send for a sample copy.

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Increase of the Signal Service Force.

Army officers, especially those stationed in and about New York, are interested in a bill providing for the doubling of the signal service corps of the army, which will come up soon before the Committee on Military Affairs of the House of Representatives.

This corps now includes 1,212 men, exclusive of officers, less than one and one-quarter per cent. of the permitted strength of the army. With the development of signal service work, the introduction of modern methods of warfare, and with the territorial acquisitions, the chief signal service officer has found it more and more difficult to carry on the work required of the corps and to keep abreast of the times with the small number of men.

General Allen, the chief signal service officer, stated in his annual report last year that the minimum number of men necessary for this branch of the service was approximately two and one-half per cent of the permitted strength of the army, or about 2,500 men.

Methods of modern warfare, army officers agree, make military research work a practical necessity. They cite the fact that the old methods of transmitting information on the field have been reinforced by such new means as the wireless telegraph, the telephone, the army balloon and, to an experimental extent, the airship.

"In the battle of Moukden in the Russian-Japanese War;" said an officer, "the third division of the Japanese army laid one hundred and fifty miles of telegraph lines. The German army has already perfected an army balloon which can be counted on to be of service in time of war, and it has also invented a balloon gun as a defense against the army balloon if used by the enemy. Unless our army can spare men for experimental work it seems almost inevitable that we will fall behind in the development of modern signal service methods."

The signal service bill provides that the signal corps of the army shall consist of a chief signal officer, with the rank of brigadier-general, 4 colonels, 4 lieutenant-colonels, 12 majors, 36 captains, 36 first lieutenants, 36 second lieutenants, 100 master signal electricians, 300 first-class sergeants, 300 sergeants, 300 corporals, 1,200 first-class privates, 300 privates, 60 cooks, 48 farriers and blacksmiths, 24 saddlers, 24 wagoners, 48 trumpeters and a band.

This measure was proposed during the closing days of the last Congress, and Judge Taft, who was then Secretary of War, said in a letter to the chairman of the Committee on Military Affairs, "It is recommended that this bill receive favorable consideration."

Lieutenant-General Arthur MacArthur in a letter to the Secretary of War said:

"In order to provide adequately for the duties and the supplementary duties of the signal corps and at the same time to secure an effective military organization adapted to the necessities of a field army of 100,000 men, the signal corps must be largely increased. And this increase must be made in view of the fact that the service of military lines of information is special and exclusive and cannot be performed by organizations extemporized after war has become imminent or, as is more likely, actually declared.

It is, therefore, essential to attach to the regular establishment a corps of sufficient size to meet all the immediate demands which would attend the mobilization of a large army. Three thousand enlisted men is the minimum number suitable for this purpose.

Obituary.

George V. Rand, an operator, of Wolfville, N. S., died on November 30.

Charles T. Hawley, a telegraph operator of Cambridge, N. Y., died at that place on November 17.

Brandie H. Rosson, an employe of the Western Union Telegraph Company, died at No. Augusta, S. C., on November 11.

Fred E. Coon, aged thirty-five years, employed by the Western Union Telegraph Company at Syracuse, N. Y., died on November 12.

W. S. Spencer, aged forty-three years, of Salt Lake City, Utah, a well-known member of the telegraph profession, died at El Paso, Tex., on November 18.

Alfred L. Kenney, aged thirty-four years, manager of the Postal Telegraph-Cable Company at Helena, Mont., for the past four years, died of consumption on November 24. Previous to his going to Helena he was a member of the Washington, D. C., force, which place he left in the hope of benefiting his health in Montana. He was an expert telegrapher, and well known in the East.

James H. Arnott, who established in 1863 the telegraph office at Binghamton, N. Y., for the New York, Albany and Buffalo Telegraph Company, and who after its merger with the Western Union Telegraph Company until his forced retirement because of ill health, five years ago, retained the managership, died at that place on November 29. He was sixty-three years of age. Mr. Arnott was at one time superintendent of the fire alarm telegraph system of Binghamton, and for forty years was intimately connected with the fire organization of that city.

Peter J. McKeever, night chief operator of the Western Union Telegraph Company at Pittsburg, Pa., and one of the best known telegraphers in that section of the country, died on November 28, after a few hours' illness. He was sixty years of age, and was a regular attendant at the reunions of the Old-Time Telegraphers' and Historical Association. Almost his entire career was spent in the Pittsburg office, where he was the oldest operator in point of service. He had a premonition that when he left his place of business the day he was taken sick that he would not recover and made all preparations for death.

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LETTERS FROM OUR AGENTS.

PHILADELPHIA, POSTAL.

Race suicide is not likely to occur in the Quaker City, at least so far as the ranks of the Postal service is concerned. The evidence is shown in the following: A boy was born to Mr. and Mrs. Moe Frankel on September 17; a girl to Mr. and Mrs. Harry Bell, on September 25; a boy to Mr. and Mrs. M. A. Auerbach, on October 1; while on the consecutive days of October 14, 15 and 16, boys were presented to Mr. and Mrs. Walter Ray, Mr. and Mrs. Joseph Beasley and Mr. and Mrs. John J. Jeffreys. Verily, a goodly number for a single operating roomffi

On Saturday, November 28, the Army-Navy annual football game was played at Franklin Field. This event always creates a great volume of business. On this day the matter was handled by Manager McNichol, in charge, assisted by Mr. E. W. Miller, chief operator, and the following staff: Messrs. Frankel, Price, Beaseley, Murphy, Mason, Auerbach, Ray, Steltz, Goldberg, Zecher, Lawrence, McLaughlin, Balmer, Fitzgerald and Myers.

DALLAS, TEX., WESTERN UNION.

W. B. Kendall was installed here as manager on December 1, vice G. C. Felton, transferred to Laredo, Texas.

E. C. Davis has returned from a thirty-days' trip to San Francisco and is enthusiastic in his praise of that office. Going westward he took the southern route via El Paso, returning by way of Salt Lake, Pueblo and Trinidad. At Salt Lake Mr. Davis had a brief visit with Manager A. W. Long.

This office is having an overhead carrier system installed, for the purpose of distributing messages, thus minimizing delay in the office. A. G. McGalin, wire chief, is supervising the work.

All of the principal branch offices of Fort Worth are now handling their business direct with Dallas, thus saving the need of relaying at the local main office.

It is pleasing to note the return of "good old times" as shown by the number of messages handled during November, which ran well ahead of business done for several years past.

A relay just returned to Superintendent J. C. Smith's office for repairs has been in service since 1877. Manager A. B. Cunningham, of Longview, Texas, who returned the relay, made this notation thereon: "On one wire and has worked faithfully every day since 1881, when it was installed (second hand, even then)." The relay will be repaired and returned.

J. B. Hardy has charge of the telegraph interests of the "News," vice J. T. Patton, transferred to the new Cotton Exchange, as manager.

C. M. Shelby, of The Associated Press, has charge of the entire Texas and Mississippi circuit.

George R. Hutton has resigned to accept a position as wire chief in a telephone office in Kansas City, Mo.

DULUTH, MINN., WESTERN UNION.

Mr. F. E. Smith, night chief operator, has been promoted to the position of chief operator vice F. L. Patterson, who has taken the place vacated by Mr. Smith, making the change in order to give his attention days to other work.

A. H. Fetzer, formerly night delivery clerk at St. Paul and later chief bookkeeper at Boston, has been assigned to the position of assistant manager.

This company has been doing extensive work in St. Louis bay, between Duluth and Superior, in dredging out a trench across the bay to receive a fifty pair rubber-covered marine cable. The present cable, which simply lies on the bottom of the bay, is continually broken by boats dragging their anchors.

Manager Crane has lately succeeded in uniforming the messenger force at the main and Board of Trade offices, and is justly proud of the neat appearance of his delivery force.

Notwithstanding the fact that navigation and mining operations were discontinued here at least two weeks earlier than usual, business has been very good at this office and held well over last year as to number of messages handled.

On account of the prospects of an early closing of navigation and the unusual dullness in these circles, the Duluth-Cleveland navigation circuit was discontinued somewhat earlier than formerly.

NEW YORK, WESTERN UNION.

Patrick C. Cusick, formerly manager at Oswego, N. Y., and later employed in this department and an old-timer in the telegraph business, died on December 7 in Bellevue Hospital, New York City.

Charles W. Hanson, the assistant gallery chief, who was ill for a short time, died at his late residence, Bayonne, N. J., Saturday, November 28. Mr. Hanson was one of the veteran employes of this department and his death was a shock to a host of friends.

May Dolan, formerly of the eastern division, was married on November 15 to H. Dutton, president of the Colorado Mining Company, and now resides at Oakdale, Long Island.

NEW YORK, POSTAL.

Mr. C. W. Harmon, manager of the 45 Broadway office, owing to ill health, has resigned and is rusticating at Hagerstown, Md., his home, where he hopes to be benefited by a long rest. J. F. Shugrue has been transferred from the 83 Gold street office to fill Mr. Harmon's place. W. Scrivens, of the 853 Broadway office, succeeds Mr. Shugrue as manager of the Gold street office. He in turn is succeeded by C. A. Francis, from the 127 Duane street office. L. P. Kearsley, chief operator at the 45 Broadway office, succeeds Mr. Francis as manager of the 127 Duane street office.

OTHER NEW YORK NEWS.

The printed Proceedings of the forty-second

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annual meeting of the Telegraphers' Mutual Benefit Association, held in New York on November 18, made its appearance on December 1, the promptness with which the edition was brought out being creditable to its compiler, M. J. O'Leary, the secretary of the association. A reading of the several reports contained in the pamphlet—those of the president, the secretary, the treasurer and that of the auditing committee—presents a large amount of interesting detail of facts and figures, revealing clearly the evidences of wise and conservative management of the association's affairs, impressive as showing the soundness and strong integrity of this sterling old concern.

Joseph Van Cura of the Anglo-American Telegraph Company, New York, is ill at his home in The Bronx, with pneumonia.

Assessments Nos. 485 and 486 have been levied by the Telegraphers' Mutual Benefit Association to meet the claims arising from the deaths of David E. Maxwell, at Gainesville, Ga.; Joseph Cook, at Muskegon Heights, Mich.; Albert Hayward, at Cincinnati, O.; Thomas F. Ryan, at Roxbury, Mass.; Lewis H. Morrell, at Indianapolis, Ind.; Frank P. Marshall, at Conneaut, O.; James J. Kelly, at New York; Fred E. Coon, at Syracuse, N. Y.; Brandie H. Rosson, at North Augusta, S C, and Harry Grime, at Toledo, O.

Miss A. A. Larkin, for many years chief operator of the Western Union Telegraph Company, at Bridgeport, Conn., was married on November 10, to E. S. Phillips, of that city, which will be the future residence of the couple.

People's Mutual Telegraph Company.

The People's Mutual Telegraph Company, promoted and organized by Board of Trade operators in Chicago, St. Louis and Kansas City, have requested the City Council of Chicago for an ordinance granting it the right to negotiate contracts with the Metropolitan Elevated Company for stringing telegraph wires on its structure. They plan to reach the city limits of Chicago via the Metropolitan to Douglas Park. A line has been built from there to Joliet. From Joliet to St. Louis and Kansas City arrangements for wire service have been made with independent telephone companies.

The promoters of the new company are W. S. Jackson of Chicago, formerly president of the Chicago Board of Trade, and Arnold Kolman of St. Paul and a large stockholder in independent telephone companies. The tolls to be charged by the new company, Mr. Jackson said, are twenty-five cents for ten words or less between Chicago and St. Louis and thirty cents for ten words or less between Chicago and Kansas City, with two cents additional for each extra word.

"Pocket Edition of Diagrams," etc., the latest revised edition, 334 pages and 160 illustrations, published by TELEGRAPH AGE, contains just the information every telegrapher requires.

The aurora borealis or electrical disturbances which put the telegraph service out of commission in a large portion of Nebraska on November 20, did not affect the successful working of the metallic telephone circuits.

The Serial Building Loan and Savings Institution, 195 Broadway, New York, which for years has stood strong and impregnable, with unimpared credit, offers a secure place for the savings of telegraphers, and solicits their accounts. It has exceptional opportunities to furnish desirable homes, city or country, for its depositors, as thousands who have derived benefit in this respect will cheerfully testify.

Advertising will be accepted to appear in this column at the rate of twenty-five cents a line, estimating eight words to the line.

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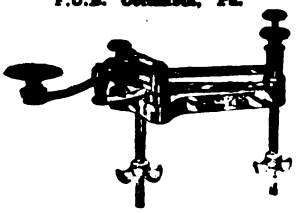

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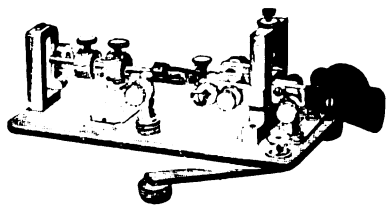

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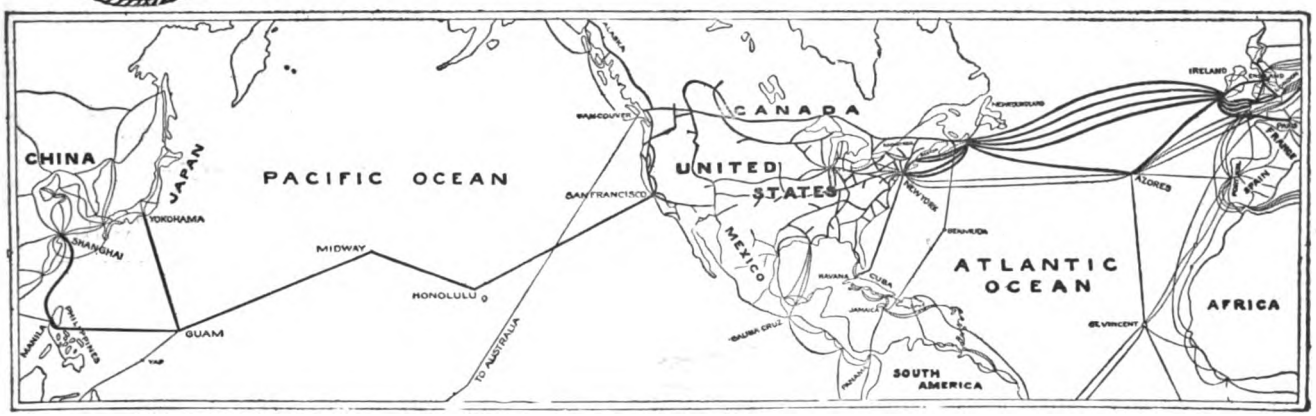

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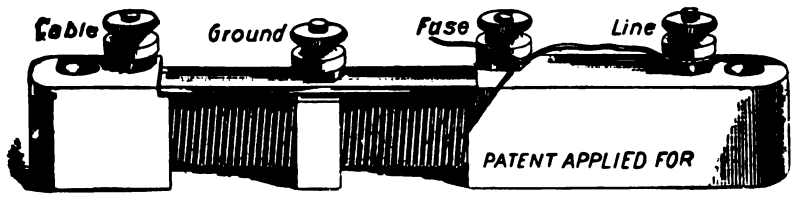

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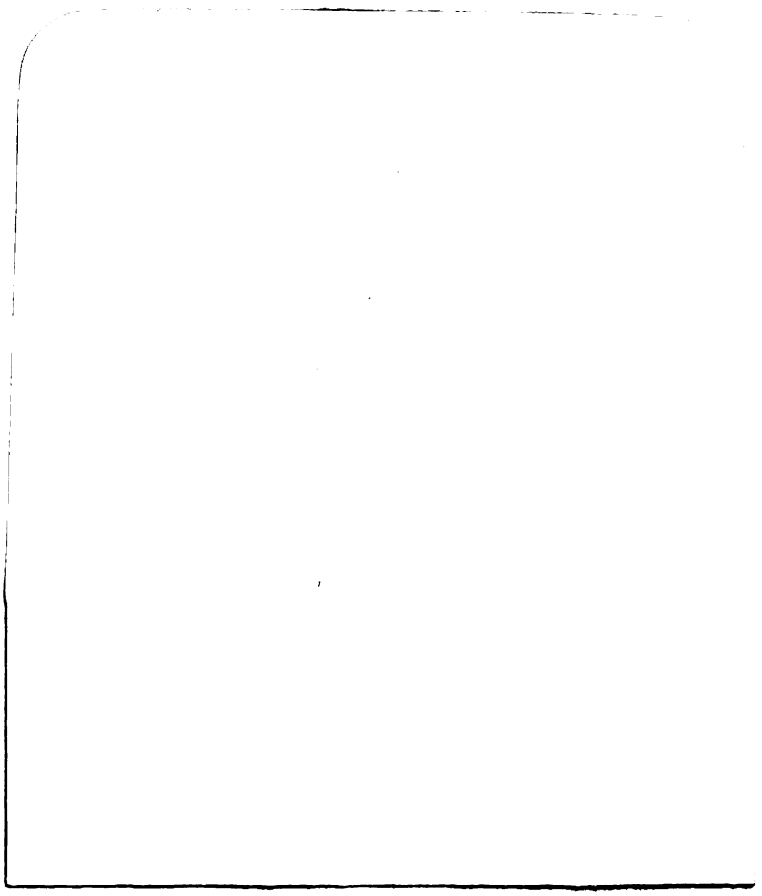

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